MODELTECH F20 TIGERSHARK.

By Klaus Weiss.

The Northrop F-20 Tigershark was designed and manufactured as a contender for U.S. Airforce Fighter Unit, but for one reason or another, it never really got the promotion it was promised and Northrop was left with the three prototype jets and a big deficit of around 800 million in its coffers. By all accounts, this fighter had the goods, and with its stubby wings and long sleek fuselage, was aptly named `Tigershark'.

The F-20 Tigershark has survived as a subject for modellers and several manufacturers are supplying kits in varying degrees of scale appearance, both for ducted fan and conventional prop. driven models.

One of the more recent manufacturers kitting the F20 Tigershark, is the ever innovative, Model Tech company of China. Well known for its built up, hand crafted planes, Model Tech are offering the Tigershark in an ARC (almost ready to cover) version, or ARF (almost ready to fly) version. The ARF version is pre-covered in a material similar to Profilm and shows a welcome departure from the more common contact adhesive type of covering normally seen on models produced in the Asian countries. There is only one colour scheme available at this time, but it is quite striking. The subject of this review is the ARF version and it has a high percentage of the construction carried out at the factory, thus saving building time.

THE KIT.

Due to the very basic nature of the instruction booklet, I will spend a bit more time than normal in detailing the assembly of an ARF kit, as it may help someone in building this particular model.
The F20 Tigershark kit contains most of the hardware required to complete it, but some of the items are of very poor quality and I replaced much of it.

The fuselage is constructed of contoured balsa and lite ply, with a fibreglass cowl and a balsa sheeted, foam turtledeck. The wings are foam cores and sheeted in Tung wood, which appears to be quite hard, but not unduly heavy. Pre-bent landing gear and lightweight wheels are supplied. Retracts can be fitted as an option.

The tailplane is sheet balsa.

ASSEMBLY.

Let's begin with the wings, as there is not much to be done here to finish these parts. The wing halves have the servo well routed out and the torque rods already epoxied in place. The ailerons are shaped and have the hinge slots cut out. There are main gear blocks already glued, drilled and installed into the wings. All that remains here is to slit the covering and fix the landing gear into the slotted timber, using the plastic landing gear straps. It would be a good idea to fuel proof the timber prior to flying the model. The main gear landing blocks are only glued into the foam cores and have no other support, so hard arrivals could possibly pull the blocks out. I haven't had any problems to date, but bear it in mind. Trial fit the halves to ensure a good mating surface. The roots on mine were a little bit out and required some sanding to achieve an acceptable match. When satisfied with the fit, use epoxy to glue the plywood brace into one half of the wing, removing any excess epoxy which oozes out. When the epoxy has cured, coat the wing roots and brace with epoxy and join the halves. Hold one half of the wing flat on the building board and prop up the tip of the other wing with a 5cm (2") block to achieve the correct dihedral. Tape the halves together and check that everything remains in alignment as the epoxy is curing. Glue the front wing plate in place, ensuring the dowels protrude at least 6.5mm out the front. Next, cut away some of the covering material from the join, being careful not to cut into the timber, and reinforce with the supplied fibreglass cloth. Use epoxy or a foam compatible CA. Attach the ailerons, using epoxy. I used the supplied hinges and pinned them for added security. If using an engine towards the top end of the range, I would feel more secure with a better quality hinge than the ones supplied. Trial fit the wings to the fuselage and when satisfied with the alignment, drill holes through the trailing edge and the plywood fuselage mounting block. Glue in the servo mounting rails and put the wing aside.

FUSELAGE.

Fit the canopy floor plate and drill a hole for the locating dowel. The floor plate was a bit on the flimsy side, as was the facing on the turtledeck, into which the dowel is to be located. In hindsight, I would have removed the covering on the cockpit floor and painted it, or glued some cross braces on the underside of the cockpit floor to prevent it from bowing when the covering is ironed down. If it becomes baggy after the canopy is glued on, there isn't much you can do about it. I also glued some 1mm ply to the back of the turtledeck facing, to add some strength for the dowel to fit into.

I fitted a 300ml (10oz.) Dubro fuel tank under the cockpit, packing it with foam to get the right height relative to the carburetor. There is quite a long distance between the tank and the engine, with a sealed compartment between the firewall and the tank. This means that you have to route the throttle control and fuel lines through this void. I bridged the space with aluminium fuel tubing and it all worked out O.K. The fibreglass cowl is pre-painted, but quite thin and perhaps a little on the brittle side. The design of the model is for a side mounted engine, so a hole has to be removed from the cowl in order to fit an engine. I used a Dremel tool for this chore and it was quick and simple. I had to epoxy an additional block onto the bottom of the firewall to screw the cowl in place there. The engine mount screws into blind nuts already installed into the rear of the firewall (and, I hope they are epoxied in) so loctite the threads, as you can't get to the nuts unless you cut

a hatch into the fuselage to access the `void'.

The fuselage has two rear hatches on the underside which need to be secured with screws. The rear one accesses the control rods for the rudder and elevator. The rudder torque rod is a bit long and could flex, so a plywood bearing block was made up to alleviate any slop in the controls. The foremost hatch accesses the servo mounting block. The nose wheel steering gear is difficult to set up, as I couldn't get my hand inside the space, but perseverance won the day.

Controls for this gear is pull / pull cables. The nose leg is actually a bit too short and the mains had to be cut and re-bent in order to have prop clearance for an 11 x 6 propeller. If considering using a bigger engine and a 12 inch prop, you will need to look at other alternatives for the nose leg. With the modified mains, the Tigershark has a nose up attitude, which isn't all that bad on the take off run. Use good quality wheel collars where they are required, and throw the supplied ones in the bin. They are far too soft and the threads strip out very easily. Finally fuel proof the firewall, fuel tank compartment and anywhere you would envisage fuel could come into contact with timber, tap the ply wood wing hold down plate and glue the balsa belly pans to the bottom of the wing. All the other setting up steps are covered in the instructions.

FLYING.

Several tanks of fuel were run through the Magnum prior to flying, but it still took three flights for it to come on song, and then it ran faultlessly. The wind was gusting around 15 - 20 knots on the day, so conditions were far from ideal for test flying. A range check was carried out and the control surfaces checked again. Taxiing across the grass field was good, with only a slight tendency to tip on bumpy patches. My mate Phil Giles agreed to do the test flights while I manned the camera. Phil flys ducted fan, so he knew roughly what to expect from the flight characteristics of this model.

The Tigershark was pointed into the wind and gunned down the strip. Lift off was smooth after about 50m and the F20 shot skyward. A couple of circuits to sort out trims and it was time to test how she responded.

Ensuring we had plenty of airspeed, big loops posed no problems. There was no tendency to snap at high speed and high rates for any of the manoeuvres performed and knife edge turns were awesome. Because of this models sleek lines, it probably looks like it is going faster than it really is, so throttle was pulled back almost to idle and up elevator applied to test the stall. It was almost a non event, with the model pitching down and regaining flying speed very quickly. Slow speed flight showed no vices at all, and high speed likewise. High rates gave tight loops and snappy rolls, Phil describing it as very lively and not for beginners. Low rates still gave crisp axial rolls and inverted flight was a breeze with only a click of down required.

Landing the model was a matter of keeping some power on in the approach and flaring at the end. Phil really enjoyed the flight and wanted a second one immediately, so the tank was re-fuelled and away he went again. Some low passes for the camera and he shot away under full power for the heavens. The .53 Magnum showed no signs of flagging and when the Tigershark was getting very small, the throttle was pulled back and a whistling power dive was performed with multiple rolls on the climb out. During a stall turn the

engine died and a hurried turn was initiated for a deadstick landing. The turn was downwind and a lot of height was lost, along with airspeed. The model was almost on the stall as it faced into wind and a bumpy `landing' was the result. No damage done, so the model was fuelled up again as the wind got even stronger. I only had a couple more frames to shoot on the camera, so declined the offer to fly on this occasion, as Phil went again. He was really enjoying this and said it was very much like flying his ducted fans. The wind was now buffeting the model on low fly bys so after several approach runs, the engine decided to quit again on cue. Turbulence close to the ground slammed the model in on the landing gear and I expected to find a bit of damage, but all that happened was one main gear mounting block had loosened in the wing. The repair consisted of re-gluing with epoxy and it was as good as new.

The Tigershark was put away for better conditions, but left no doubt that this was a nicely performing addition to the Model Tech range. Having completed the photos for the review, left me itching for my chance to test my skills on the F20 Tigershark.

The Model Tech F20 Tigershark is available from Kelletts Hobbies.. Liverpool N.S.W. 2233.

SPECIFICATIONS.

Wingspan:	120mm (47 inches)
Area:	535 sq. inches.
Weight:	2.5kg - 3kg (5.5lbs - 6.5lbs) Test model 6lbs.
Length:	137mm (54 inches)
Engine:	.40 - .60 two stroke.
Engine used:	Magnum XL .53 with APC 11 x 6 propeller.
Radio used:	JR 388S 8 channel computer. JR 511 servos used throughout.
Control throws:	Rudder - 50mm high rate, 30mm low rate.
	Elevator - 8mm high rate, 5mm low rate.
	Ailerons - 5mm high rate, 3mm low rate.
	C.G. - 146mm (5.75 inches) from L.E at wing root.