# HELI-PAD

by JOHN HEATON

As I promised; the **Kalt** *Cobra* is the opening subject of my column this month.

## Brief constructional details

After studying the plans and diagrams I began by fitting the engine and gearbox to the transmission plates. The clutch, which presented no problems, appeared to be a very well designed unit featuring friction material bonded to hinged shoes. Fitting the engine was a simple operation consisting of marking and drilling four holes and bolting the motor in position. On this model the tail rotor and throttle/collective pitch servos are fitted and linked up whilst the whole transmission unit is out of the fuselage; these were fitted quite easily without problems as slotted servo plates are provided which should suit most modern servos. The main assembly was then offered up to the fuselage and mounting holes drilled in the ready bonded-in woodwork. The tail rotor gearbox fitted quite easily and the tail drive shaft was then checked for correct alignment.

The cyclic servos are positioned near the swash-plate in the fuselage. Having more or less finalised all mechanical parts I stripped everything out to finish the fuselage. The finish as supplied was so good that a quick rub over with fine emery paper was the only preparation needed before the first, and only, primer coat was sprayed on. I then applied dummy rivets using a hypordermic syringe and PVA white glue. A top coat of brown paint was then sprayed on followed by one coat of fuel proofer. Final assembly came next, no real problems, but, due to the slimness of the fuselage I found it easier to drill a couple of holes in strategic places to assist in the tightening of various bolts. When assembly work was finished these holes were covered with small discs of black Fablon.

**Below; 'hands off'! The stability of the Kalt *Cobra* is obvious in this shot, or, was meant to be! His right hand *is* clear of the Tx – 'honest Injun!**

## Flying the Cobra

I was gratified to find that, even allowing for the extra time studying various details (this was a new model) the time between opening the box and starting the motor for flying was only two days.

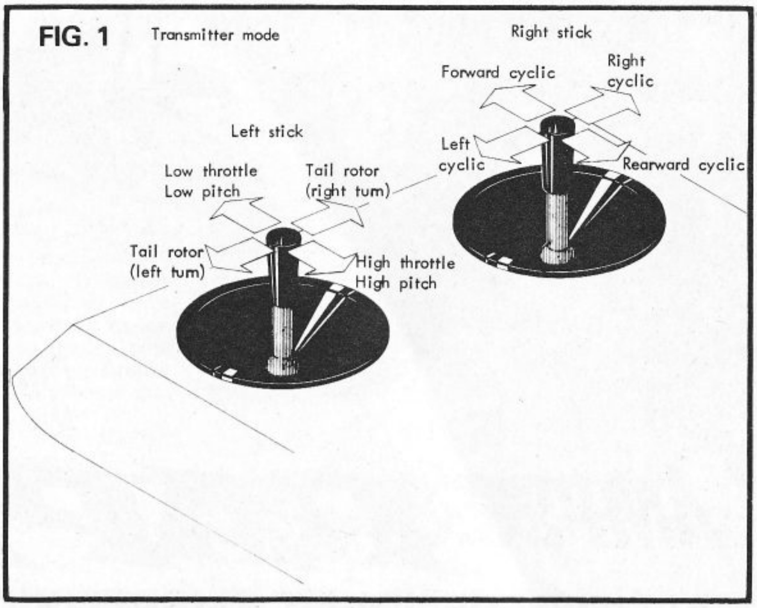
The O.S. .45 engine which I chose to fit (despite the kit being labelled .50-60 size) started easily and, after weakening the idle adjustment slightly, I placed the model on the ground and it flew straight off the board with no fiddling whatsoever. I flew the model intensively for one week i.e. about 15 hours flying time. I found it particularly stable on the cyclic controls and having an outstanding tail rotor response which was not in the least twitchy and having enough power to do 360° hovering turns in winds of up to 20mph. Whether this response was due to the cambered tail rotor blades or the aerodynamic shape of the fuselage I don't know, but I was very pleased with the performance.

I then dismantled the model. I found nothing loose or amiss, but I increased the collective pitch range slightly and reassembled. The model has been flying in this form for many hours now without a hint of trouble and has subsequently been fitted with rockets and moving gun turret. It is interesting to note that even with a 9.6v Ni-Cad battery fitted to fire the rockets and operate six servos, there is still more than adequate power with the .45 engine. In fact, I would say that the general performance is better with the extra weight than without. It appears to make the model fly more smoothly in turbulence and gives the engine a bit more work to do. I can in fact fly with the engine four stroking most of the time. If asked to sum up the *Cobra,* the description that springs to mind is that it handles just like a 212 with modern innovations like autorotation freewheel, single bolt blade fixings, semi-symmetrical blade sections and ready bonded woodwork and let's face it, that's not a bad recommendation!

## Transmitter Mode

I had a long discussion today with a customer about the thorny old subject of transmitter modes. In my view the correct one and the one I use and advocate using if you start from scratch is as follows. (FIG. 1.)

**FIG. 1**

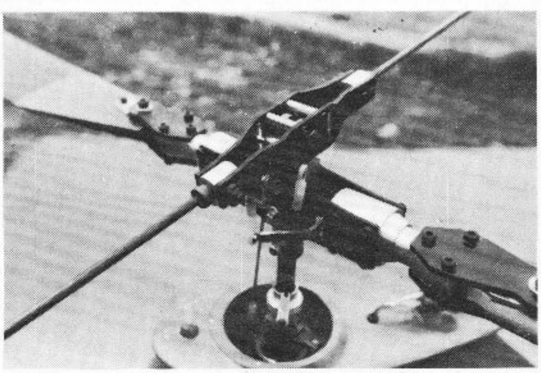


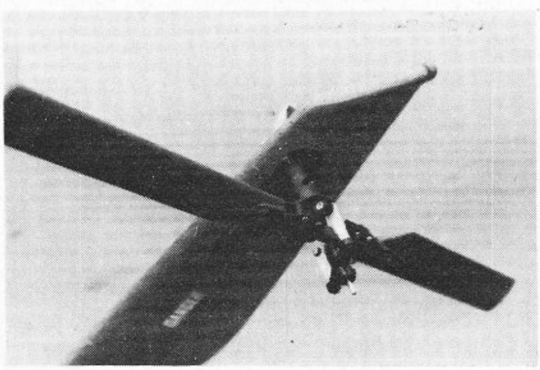

As can be seen this corresponds to the most popular fixed wing mode except instead of pushing the left stick forward for more power, it is pulled back towards you. A moment's thought and you will realise that the left lever fore-and-aft is primarily an aerodynamic control i.e. more or less lift – throttle purely incidental. How much easier it would be for us if like full size turbine jobs we could dial an RPM and the engine would look after itself. Most model helicopter pilots, I would say, fly the above mode but reverse the left stick, i.e., push away for more lift while a few 'odd balls' fiddle about with collective on the right stick (apologies to you South Coast boys Mick, Philip and Co, John with The Gazelle; – congratulations to Derek who re-learned the proper way!).

On a more serious note I can see a pattern in all this in as much as the people who fly throttle right either learned in the 'reed' days or were helped in the early stages by modellers who flew with reeds, when you had no choice as the switches were not double axis simultaneously, encouraging separate sticks for primary control which is not ideal.

The pattern for helicopter fliers who fly collective 'left push' for lift is a follow-on from fixed wing flying where it is established 'push' for power. After 15 odd years of proportional flying most people now appear use Mode 2, i.e., throttle left which is the obvious way to go. When we get 15 odd years into helicopters I predict most fliers will fly collective pull for lift, which, dare I say it, is the obvious way to go. Otherwise why do full size designers rig things that way!

**Below left; main rotor head of the *Cobra* and, below, the *Cobra* tail rotor unit.**





## MacGregor Models

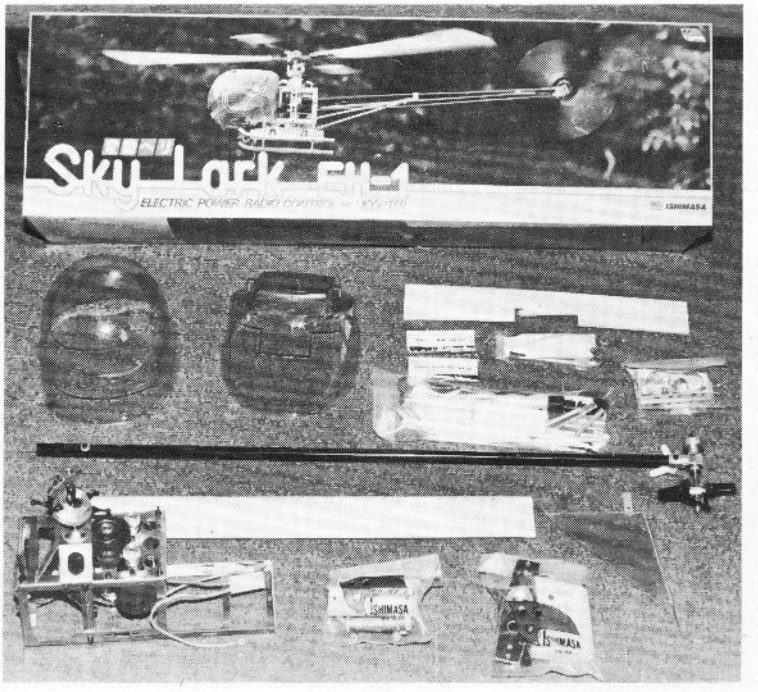
If an off-road i/c powered car is to be competitive in races, it has to strike a very delicate balance between strength and weight. One vehicle that appears to have caught this balance is the **Sankyo** *Sigma G.II BMW.M1,* and a sample of this superb kit has been loaned to us by **MacGregor Radio Control,** Canal Estate, Langley, Slough.

The basic chassis of the *Sigma G.II* consists of two lengths of 1cm square section aluminium extending the full length of the car plus 8 mm diameter solid aluminium cross struts. The sheer size of the steel front bumper makes us feel very sorry for any concrete post unwise enough to stand in the *Sigma's* way.

The engine, gearbox and front end suspension components have to be attached to 2 mm alloy sheets which have been drilled and cut ready for use. Pressure cast alloy is used for the rear and front suspension arms and the gearbox casing. Trailing arm suspension is used throughout with torsion coil springs on the front and compression coil springs at the rear. Two pairs of dampers are supplied pre-assembled and oil filled, the pair for the rear suspension containing a more viscous oil than those for the front to obtain correctly balanced suspension. All wheels are 4 inches in diameter and although the front tyres have the now established deep circumferential treads for directional efficiency, the rear tyres feature a fascinating mixture of bumps and raised rings for good traction. An efficient looking clutch with solid block metal shoes transmits the power to the gearbox, which provides an 8.25:1 reduction ratio. An air filter for the carburettor is provided in the kit, and other accessories include a steering servo saver and fuel tank.

A vacuum formed radio box is included and the builder has the chance of fitting his own ideas on watertight linkages. Basic dimensions are; 60mm x 270mm overall, 315mm wheelbase, weight 2.9kg. Available from MacGregor stockists, the *Sigma G.II BMW.M1* off-road racing car ("buggy" sounds rather derogatory to our ears) costs £129.00.

Another new item from **MacGregor Industries** is in complete contrast to their off-road racing cars, in fact, it's 'different' whichever way we look at it. The **Ishimasa** *EH-1 Skylark* is nothing less than an electric powered helicopter capable of independent flight in the manner of a 'normal' model helicopter. Requiring lightweight four function radio equipment, the *Skylark* is powered by a pair of RS540S motors. An 8 cell, 1.2Ah Ni-Cad pack may be fitted for independent flights of up to four minutes duration, while a 7 metre umbilical directly connecting the helicopter to a 12 volt car battery gives the model an almost indefinite endurance. The advantage of this extremely long duration on the umbilical combined with almost silent operation is that the novice can acquire the necessary skill to hover the model while practising in the privacy of his own back garden (the lead acting as a restraint and preventing the *Skylark* demolishing the neighbour's tomato plants and greenhouse).




Basic specifications are overall length 846mm, rotor diameter 992mm and a maximum flying weight of 1.8kg. The front fuselage is essentially a light alloy cage which carries the two motors and the rotor shaft, the radio gear and mechanical motor speed controller being carried in the nose of the machine. A fixed pitch rotor head is used and both the main and tail rotor blades are cut entirely from hardwood, presumably for a good flywheel effect. The tail boom is a lightweight tube and the tail rotor hub is already fitted. Tail rotor drive is via a rubber belt. Vacuum formed Lexan mouldings make up the fuselage bubble.

The **Ishimasa** *Skylark EH-1* costs £89.95 from MacGregor stockists.