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## BARON 30

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**JOHN STRACHAN  
PIECES TOGETHER THE  
LATEST 3 IN 1  
MACHINE FROM KALT**

# KALT BARON 30



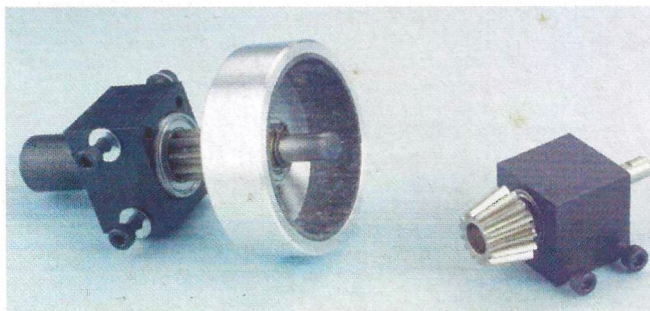
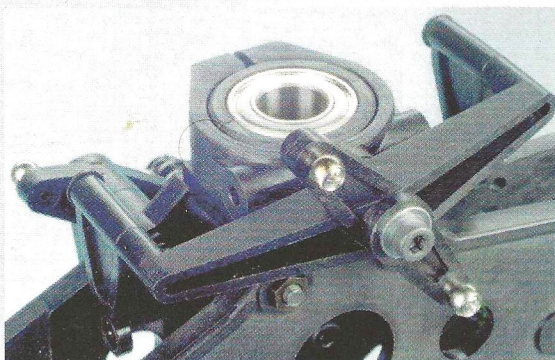
**T**he Kalt Baron 30 is a new entry-level helicopter that succeeds the enormously successful Space Baron. A hard act to follow. In fact the Baron 30 shares many components with the Space, but simplifies what was a very complex, although robust, transmission system. The simplification of the mechanics, away from the planetary gear system to a conventional main gear, has enabled Kalt to price the new machine very competitively. The overall dimensions are similar to the Space Baron, which incidentally will be supported for some time to come and Baron 30 parts are due to find their way onto Space Barons as upgrades, as the new helicopter has push / pull on most controls.

As the machine is likely to be targeted toward newcomers, I have decided to write this review with the needs of the beginner in mind. One of the most desirable items in a kit, as far as a novice is concerned is a clear and concise instruction manual. The Baron 30 excels in this department, although, in common with most Japanese translations, has a style of writing that

allows the odd chuckle during construction. No problem with the accuracy or emphasis though. The manual takes the beginner through the tools and accessories needed to complete the model before providing a much needed glossary, with illustrations of the various fixings that will be used in the construction and how to identify them.

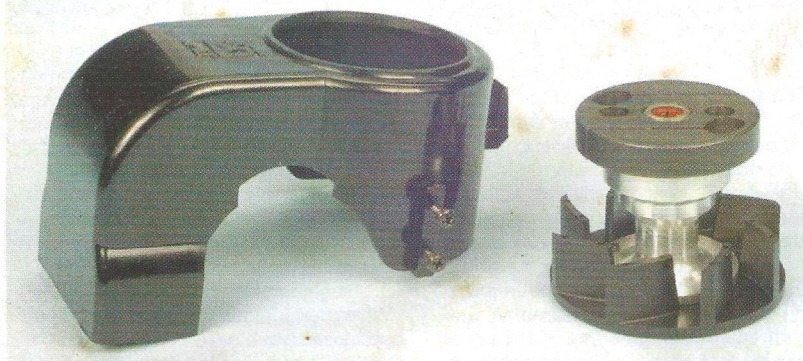
The manual is quite a thick tome, some 99 pages. There are two reasons for this, one is the depth of information available, and the other is that the book covers all three variants of the Baron 30. Yes, this model will be available in the usual two-stroke configuration, as well as a four-stroke glow motor model and an electric. As the instructions and part numbers for all are supplied with the kit, it is likely that conversions between the variants will not be difficult to accomplish retrospectively. I have had the pleasure of flying a four-stroke baron fitted with an Enya 53 motor and it was delightfully torquey and oh so quiet. As the parts become available, this will be my preferred configuration.





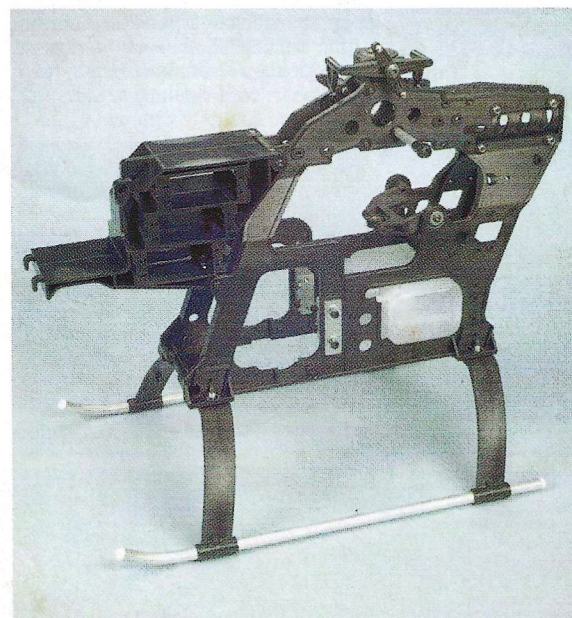
(FAR LEFT). The Fore and Aft crank system complements push pull controls.

Clutch bell assembly. The lining is pre fitted as is a one way bearing for the starter system.



(ABOVE). Fan and clutch. The one piece clutch should be man enough to withstand any learners efforts.

Main frames are pre drilled for two-stroke, four-stroke and electric versions.



## BUILDING THE MODEL

As is almost universal practice with helicopter kits, the components for each stage of build are packed in separate bags which are numbered to reflect the building stage. The Baron 30 takes this concept a stage further, and packs the screws and fixings for each stage in separate and numbered bags.

Building proper begins with the assembly of the pitch lever and arm. Although this is an apparently simple operation, do remember that quality begins when you open the box. You will by now have read through the instructions several times and have realised that quality in helicopter terms is achieved through smoothly operating control movements. This is the first chance to put words into action. The instructions have two recurring dialogue boxes that are extremely useful. The first is the 'One point' box which is a note, usually about a quality issue on the stage you are building, and an 'important' box, which is invariably a safety issue at the point you are working on. Both these are nicely implemented. To return to the pitch lever and arm, ensure there is no friction between any of the adjacent surfaces by carefully filing any excess material between the moving parts. The fuel tank fittings are next on the agenda, again, a dialogue warns you to

ensure the tank is spotlessly clean inside and guides you through the process.

A move now to start building the mechanics of the helicopter, assembling the clutch bell, pinion and tail bevel gear. Use threadlock where advised, but always do so sparingly as it does not facilitate smoothness in bearings! This accomplished you will be directed to add the starter shaft, bearing block and hex start. Again simple stuff, but read the dialogue boxes for their helpful hints, such as ensuring the set screw does bare against the flat machined for it, and not the round section of the shaft. You are now ready to start assembly of the main frames. The helicopter starts to take shape. Before screwing the two sides together study the diagram carefully to avoid missing anything from the centre of the frames. To insert these items afterwards is a pain. After fitting the tail bevel gear you assembled earlier, you can put the frames aside and become an engineer.

Stage nine sees you fixing the components that are mounted on the motor, namely the cooling fan, flywheel and clutch. A good way to secure the prop nut is to insert a hard wood dowel into the carburettor hole to lock the crankshaft. This is easier than removing the backplate and far safer than

inserting anything in the exhaust port, which you should NEVER do, although I have seen this suggested in some instruction leaflets! The tip with the assembly of these parts, which will all spin at engine speed, is to tighten everything gradually and uniformly to encourage all the parts to seat correctly. It is possible, if you use an Irvine motor or an SC as I did, that you will need a slightly modified flywheel to fit the crankshaft profile. Ask when you buy, as if your retailer does not have the modified part, one can be shipped to him by return of post. Fitting of the engine mounts completes the power unit assembly.





## THE BUSY BITS

When constructing the rotor system, two mixer arms are the first sub assemblies. Again the dialogue boxes carry sound advice in the method of fixing the moving parts. The baron 30 manages the compromise between cost and quality well. Although all bearing surfaces are plastic, the bushes allow you to tighten the fixings securely before the bushes bind up. This has not been true of all models in the past, some of which have required a very sloppy fit to allow free rotation on the bearing bushes. The mixers are now screwed to the mixing base, using two special bolts, once again, you can tighten these securely without compromising the freedom of movement of the joint. These bolts do require a box spanner or nut spinner to tighten them, not pliers. If you do not end up with a free moving pair of mixing arms, check your assembly carefully and rectify the problem before moving on. The same applies to the next stage, where the elevator lever is fitted to the mainshaft collar along with the swashplate universal links.

The next step is critical to the performance of the helicopter and is the

installation of the collective pitch system. The implementation is the Space Baron system with an operating rod that passes through the hollow mainshaft. This is a very robust pitch system but can be a little fiddly to get right. Four panels in the instructions guide you past the potential pitfalls but time is a resource that should not be spared on this stage. When completed, the mixer should comfortably fall back down the shaft under its own weight after you push the rod up the main shaft and let it go. If it does not, go back to the start, do not collect £200 and reassemble again until it really is free running. When complete use only a very little silicon oil or grease on the mainshaft, as oil and grease attract dirt which gradually conspires to make the slider stick.

Another change of scenery now as the clutch bell / starter shaft assembly is placed in the side frames. The instruction page for the next stage is a very busy looking document, because several parts come together at once. However, read the whole page several times and all will become clear as the mast is put into place, the pitch arm connected and the main gear and thrust washer are installed.

All these are held in place by two collars which use four set screws apiece to hold them in place. It is not necessary to over tighten these setscrews, as the sockets will round off if you force them. Before tightening the top collar pull the shaft up towards you while pushing the collar down towards the frames to ensure the mainshaft has no up and down play between the bearings in the side frames. Sounds complicated but is much easier done than said. Easy that is, assuming you remembered to fit the bottom collar first, otherwise the shaft will pull out!

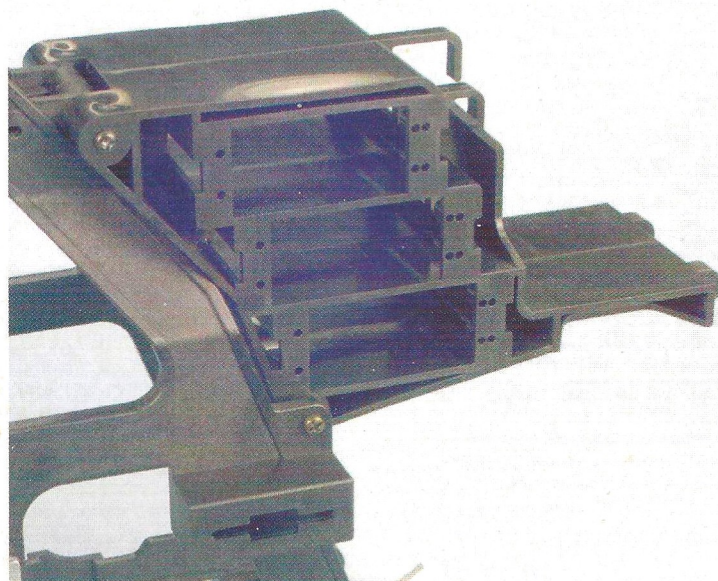
After all that exertion, a nice peaceful interlude as you fix the control balls to the elevator and aileron operating arms. Once complete, these are screwed to the sideframes. Do make sure you use the correct length of screws to fit the balls. They are the shorter of the two lengths of silver coloured screws that are contained in the bag with the balls. If you use the wrong ones you will have considerable problems to contend with later on. Again, the two operating levers must rotate freely about their bushes. We are building in quality as we go. Next item to be fitted is the cooling fan shroud. The instructions advise what action to take should the fan touch any of the other components, although mine fitted fine as it was. At this stage fit the radio switch harness. If you do not yet possess one, go and get one, as fitting it later is a nightmare of disassembly and heartache. I know, I've been there.

You are now ready to fit the motor into the side frames. On the face of it a very simple task but one which takes much care and patience if you are to avoid component failures later on. The way to do this is to ensure that there is no drag between the clutch bell and the starter hex when either is turned manually. The instructions cover this point in a splendid version of 'Englapanese' at it's best.

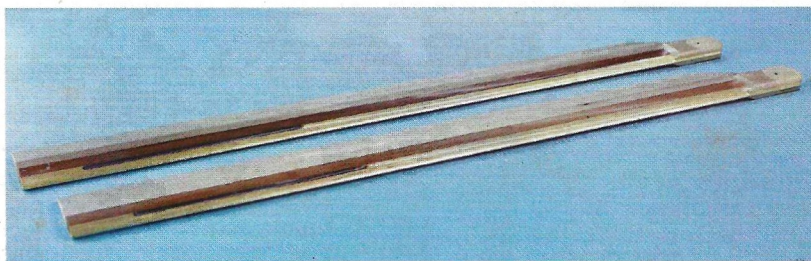


(FAR RIGHT).  
Servo crate is  
easily removed for  
maintenance.

This shows the  
mast assembly  
topped by a  
variant of the S30  
head.







The only way to ensure the assembly is true is by trial and error. Once the motor is mounted, turn the starter hex by hand. There should be no resultant movement of the clutch bell at all. If this is OK, try it the other way by turning the clutch bell and observing any rotation of the starter hex. If either test fails there is no other resolution but to loosen the motor again, check alignment by eye, re-tighten and perform both tests again. Continue until you are satisfied that the alignment is true. Failure to follow this laborious procedure will almost certainly result in vibration, leading to a broken clutch, damaged bearings or worse.

After completing the engine installation, the pace slows down a little with the fitting of the skids, (the rake points forward) and the servo carrier frame. A magnetic screwdriver is a boon for the small screws that fit in the recesses of the frame. You are also advised to fit the muffler at this point. I chose a standard Kalt muffler to go with my SC 32 as the combination is both quiet and forgiving on the engine tuning stakes. Fuel lines are the next task, no problems here as all the fittings are easy to get at. Don't forget to fit an in-line filter in the feed tube.

#### HEAD START

Nearly at the end of the build now, and the penultimate assembly is the rotor head itself. Not difficult to assemble, although it will come as no surprise to you by now that all rotating surfaces must do so FREELY. The head yoke is attached to the centre hub and then the see-saw is attached to the centre hub via its outer and inner bearing collars. This accomplished, the solid axle feathering shaft is fitted to the yoke. The manual insists on referring to rubber 'Dumpers' but these items are generally called dampers, or 'teeter rubbers' in this country. Two ball races per blade holder complete the assembly of the rotor head. The damper rubbers will be

quite stiff at this point, but will loosen up after a few flights. Next item to be fitted to the rotor head is the fly - bar or stabiliser. It is generally good practice to grind two flats onto the flybar where the setscrews that hold the control arms bear on it. This is particularly desirable as the flybar follows the current trend of manufacture from a very hard steel. Although this is good for control of the model it does mean that the setscrews are unable to bite into the metal. The two control arms must be affixed to the fly bar in such a way that the flybar is held exactly centrally in the carrier, and the control arms must be exactly 180 degrees opposed to each other for the helicopter to fly nicely. Be careful with the threadlock though, as it will not help matters to get any onto the flybar bushes. The last action in this section is to attach the centre hub to the mainshaft, using the centre hub collar.

#### TAIL END

A move now to the other extreme of the model, as the tail boom and gear box are constructed. This part of the model is pure Space Baron and always worked well on that model. Areas to be careful about are the installation of the set screws on the tail joint, these as always, must hit the appropriate flats. The tail gearbox should spin without binding at all when the drive wire is turned. The instructions call for a little grease on the gear wheels. I am not a great believer in the use of grease on nylon gears, but a small dab of silicon grease should do no harm.

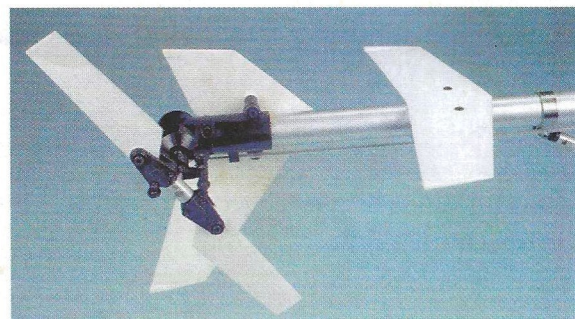
One point to be very careful with concerns the fit of the long setscrews into the tail rotor hub. On my model the threads were very tight and would not easily screw home. In order to avoid damaging the setscrew hex, it is best to run an M3 bolt right through the tail rotor hub before fitting the setscrews. This will clean the threads without causing damage to either component. The tail blades are held in place by two ball bearings, which is adequate for this kind of model. The tail blade holder bolts should not be over tightened. If you leave the blades so that they fall gently under their own weight then they will be about right. This is a good tip for beginners as there is more leeway for tail touches on landing. Secured like this the tail blades will fold back rather than break or stress the tail drive system. The wire tail drive will also 'wind up' in this situation and protect the bevel and main gears. Carbon tail drives are no friend of those learning to hover. Obviously the tail bolts must be screwed into the nylon locking portion of the nuts.

It is now time to fit the tail boom assembly onto the model. Vitally important is the need to ensure that the setscrews on the tail drive wire joiner are positioned correctly. One of them must bear down on the flat ground in the bevel gear shaft. Use plenty of thread lock on the joint.

*The laminated blades supplied are of good quality and ideal for general sport flying.*

*Pre ground flat on bevel gear shaft leaves no excuse for tail joint failure!*

*The Baron 30 tail end is from the tried and tested Space Baron and will cause no concern.*

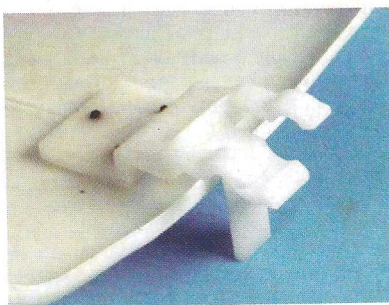




Body is moulded from a very tough polypropylene which should be forgiving in an incident!



The body catch allows the body to tilt up for access to plug - a clever design touch.



(FAR RIGHT).  
Clever tank design allows for good flight duration.

Once the tail boom is in place a good test of the drive wire integrity is to grasp the rotor head in one hand and turn it as far as it will go clockwise (probably more than 180 degrees), whilst holding the tail blades still with the other hand. What you are doing in this test is to fully wind the tail drive wire. While the pressure is applied there must be no slipping or ominous clicking sounds. Both these symptoms indicate that the tail drive will slip in flight. This must not be allowed to happen. One area that puzzles me is the choice of route for the tail pitch change wire. This is shown as being routed to the left of the machine when there is a blank servo position on the right. If the servo were fitted in the blank right hand position the pitch change wire would have a much easier route. Mine is as per instructions currently, but I suspect it will be moved to the other side quite shortly. Last items on the tail are the horizontal and vertical stabiliser fins.

## BODY SHOP

The model itself is now complete apart from the canopy. This is made of a tough polypropylene and should be pretty well bullet proof. The best method of cutting away the excess material is to score along the lines with a sharp scalpel and then cut along the score line. This way the canopy material can be cut accurately and safely. The good news is that the screen fits exactly with no trimming. This is something I have longed for as a poorly fitted screen always spoils the look of a helicopter.

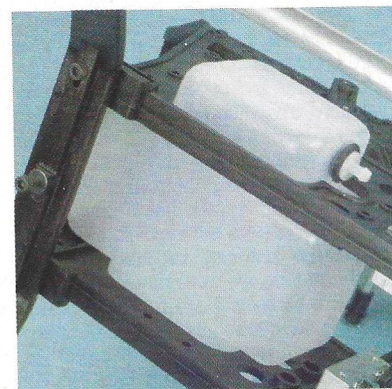
The servos are fitted into the servo tray next. The manual explains the use of ball joints and links very clearly. Once all the rods are assembled and fitted as per the lengths in the instructions you will find that the control system has become quite stiff. This is a result of the push / pull system having to move so many ball links. To overcome this you gently crush the link while it is fitted on the ball. A good variation of this tip was shown to me by Ali Newman of Avicraft, who uses a small pair of mole grips adjusted so that they just move the ball link. Done this way each ball joint is eased by an equal amount. All that is left is to carefully adjust the control surfaces as indicated. The instructions are quite concise in this area, so you should end up with a helicopter that flies straight away. This said, however, there is no substitute for having your handiwork checked by an expert.

## CHECK IT OUT

Most model shops are willing to check a model over for a small fee and will often do this free if you bought the model from them. If you cannot arrange to have the model checked in this way then another possibility is to grab a competent flier at a model helicopter club. Most that I know are glad to do this in order to maintain the safety record that model helicopters enjoy. A club is also a must if you are serious about learning to fly your helicopter. Ask at your local model shop, as they

are often well aware of the club situation in their area.

Once you have completed all the previous steps you will find that you have a helicopter which flies nicely. My own model was built on the kind of budget that a newcomer might have to work to. The motor is the SC 32 ABC, a budget motor that powers the machine adequately and is perfectly reliable. The servos I have used are SuperTech items, available from most model shops and are also budget items. The result is the least expensive helicopter I have owned and yet it is very pleasant to fly. I look forward to converting it to a four-stroke later in the year, as I feel this is the way helicopters must go in order to accommodate the environmental issues we nearly all face. To date my Baron 30 has had initial flight tests, which, due to the freezing weather over Christmas and the New Year have not been



exhaustive. The signs so far are good and I expect the Baron to be a good all round sport helicopter, once the final adjustments are made and the motor has become fully run in.

To sum the model up, it is extremely good value for an entry-level helicopter. It is simple to build and maintain and with its pedigree should fly all manoeuvres well. There is already a queue forming within my club to get a fly of the Baron 30 and later in the year I will update the story of this model. Incidentally my prophecies are already coming true, at our field last Sunday two beginners appeared with Baron 30s that needed checking and trimming. Both flew with the very minimum of attention and fuss. ●

## HELI FILE

<b>Name:</b>	<b>Baron 30</b>
<b>Manufactured by:</b>	<b>Kalt</b>
<b>Available from:</b>	<b>J. Perkins stockists</b>
<b>RRP:</b>	<b>£249.95</b>
<b>Main Rotor Diameter:</b>	<b>1249mm</b>
<b>Main blade length:</b>	<b>550mm</b>
<b>Tail rotor diameter:</b>	<b>124mm</b>
<b>Tail blade length:</b>	<b>82mm</b>
<b>Overall length:</b>	<b>1150mm</b>
<b>Empty Weight:</b>	<b>2.7 kg</b>
<b>Review engine:</b>	<b>SC 32</b>
<b>Radio:</b>	<b>Futaba FF8 with SuperTech servos</b>
<b>Required No. of channels:</b>	<b>5</b>