

The World's Leading R/C Model Helicopter Magazine

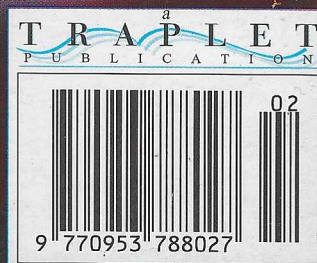
MODEL Helicopter WORLD

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Kalt 30 Baron –
2 STROKE, 4 STROKE
OR ELECTRIC?

New
OS Max 46 Fx
ENGINE TEST

Shizuoka Show Report



3 HELICOPTERS—1 MODEL!

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R/C Helicopter

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3 in 1
No Compromise



SRP
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(2-stroke)

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The Baron 30 makes life easy and fun, and gives you peace of mind. It's great value. It's bigger than your average 30-size trainer and it features a

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LARGER SIZE AT A LOWER PRICE

A larger helicopter gives better stability.

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Give peace of mind.

PROVEN CONTROLLABILITY

Next-generation Space control system brings assured and proven controllability.

REALLY TOUGH

Composite components feature throughout, 10mm main shaft, blow-moulded body with super attractive sleek styling.

Designed to take whatever you throw at it.

Rotor diameter	1,249mm
Weight	2.7 Kg (2-stroke)
	2.9 Kg (4-stroke)
	3.9 Kg (Electric)

EXPERTS & BEGINNERS READ THIS

HEX TOP-START

Easy to use twin-ballraced top start is more positive than cone start.

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Enormous 290ml tank is clearly visible from both the rear **and** from the side of the helicopter.

HIGH QUALITY STAINLESS STEEL BALLS

Used throughout control system—no plastic balls or "Z" bends.

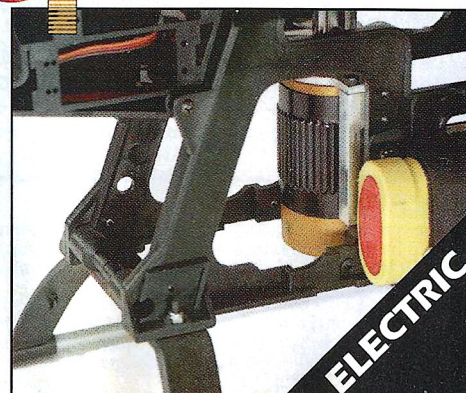
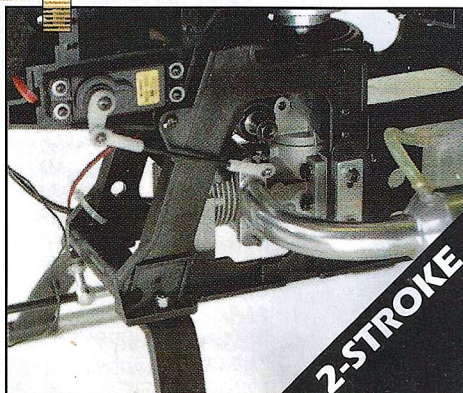
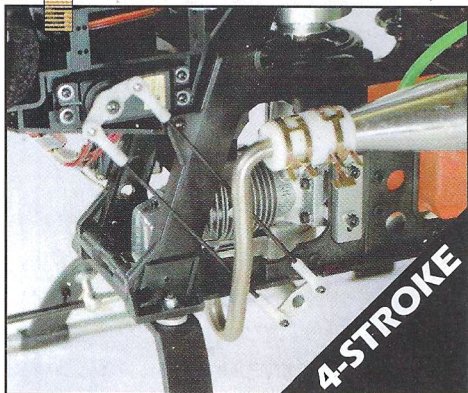
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BARON 30
High Performance
R/C Helicopter

2-Stroke, 4-Stroke, Electric



KIT REVIEW

HERE WE HAVE IT, KALT'S NEW BABY, THE THREE IN ONE 30 BARON.

Kalt's new baby is the 30 Baron and is one of the most versatile 30 sized models on the market. Although it supersedes the Space Baron, many parts are common to both models and this approach brings advantages. Firstly is that these common parts are well tried and tested, second it helps maintain spares availability for the Space Baron and thirdly it keeps the price down of the 30 Baron.

With this new model, Kalt has moved away from the more complex planetary drive system returning to the single drive reduction that is a common feature of current 30 sized models. The layout is familiar, engine up front, cylinder head pointing forward and the tank at the rear of the frames. In addition to this layout, Kalt have stayed with the use of moulded side frames and their experience shows in their superb quality. A wire tail drive is one of the common features with the Space Baron as is the collective pitch mechanism that uses a pushrod running through the hollow mast linking to the mixer base (as the mixer base rises, collective pitch increases leaving the swashplate in situ).

The all important rotor head uses a 5mm feathering shaft to support the plastic blade grips, while the head centre is aluminium with a plastic top moulding. This approach is a good compromise as the head is solidly fixed to the mast while the plastic parts help to keep the weight and costs down.

An important improvement is the closed loop controls on the cyclic controls which has been ingeniously done. All Kalt have done is to change the swashplate control so that it is now supported front and back (an improvement in itself) with a new lever operating from the left while another new lever on the right controls the roll cyclic.

To round things off, add a hex top start system as standard and a new moulded canopy which is cleverly fixed, the bottom clips to a cross member so that when the bottom is released, it hinges upwards allowing very easy access to the glow plug. Nice touches showing that the designers were thinking of us modellers at the time!

What will not have escaped notice is that the 30 Baron is advertised as a 3 in 1

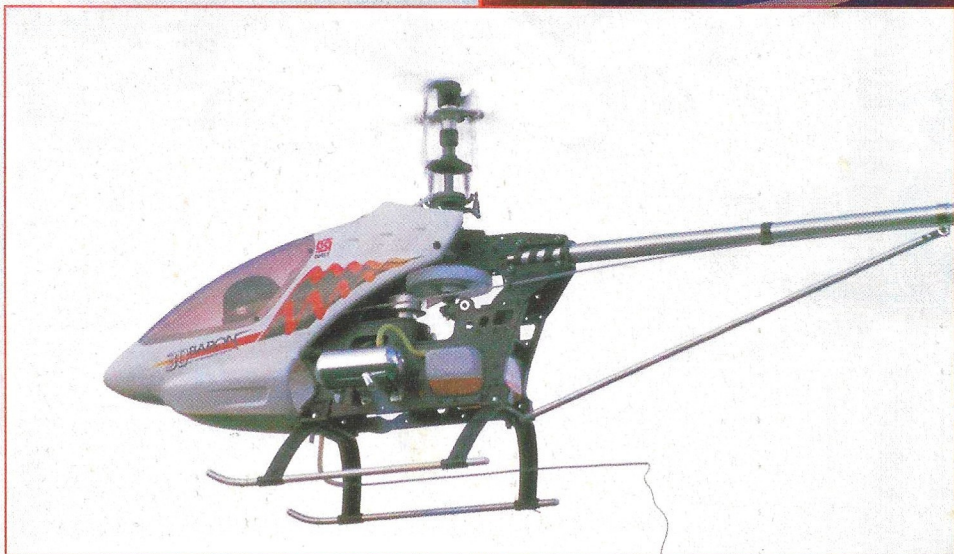
model, it isn't quite a buy one and get two free, you buy one that can be powered three different ways making three very different helicopters. The airframe is designed to accept four stroke, two stroke or electric power and that is what the many unused fixing points and mouldings are for. At present the two stroke version is available and is the subject of this review. We understand that the four stroke conversion will soon be available followed by the electric. As an aside the UK importers

J. Perkins Distribution have been flying one of the four stroke versions powered by an Enya 53 FS, I've seen it fly and it performs very well, plenty of power and super quiet. The 100 page instruction manual covers all three versions of the model.

To change power plants a conversion kit will be needed which is likely to include a new clutch pinion gear and engine mount for the 4 Stroke, plus of course a suitable engine and exhaust system. For the electric, the clutch will not be used so the



The Kalt 30 B



parts needed will be the motor, drive gear, speed controller, battery packs (two 10 cell nicads), charger and fitting parts.

How does it build?

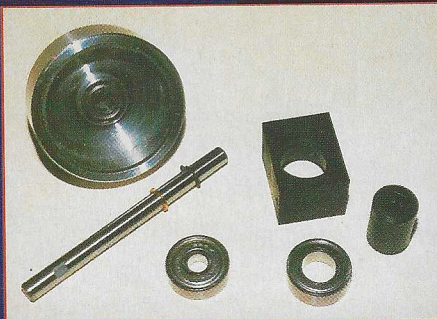
The review kit is the two stroke version and came supplied with the Japanese instruction manual (gulp!). There was no need for panic as the building section consisted of first class diagrams including full size pictures of the parts used. Another help is that all the screws and bolts sizes are listed in English as well (Phew!).

Following the stages of the build through step by step is easy and a complete beginner will be able to build this model just by following the instructions - provided they understand the basic principles of this type of assembly. By this I mean; screws and bolts need to be done up tight but not stripped, shafts running in bearing should not have any end float but should not pre load the bearings, meshing gears should be adjusted to give slight backlash and the tube titled 'KALT' used throughout the manual means apply a small amount of thread lock.

The first time that thread lock is needed is with the pinion gear ▶

Baron





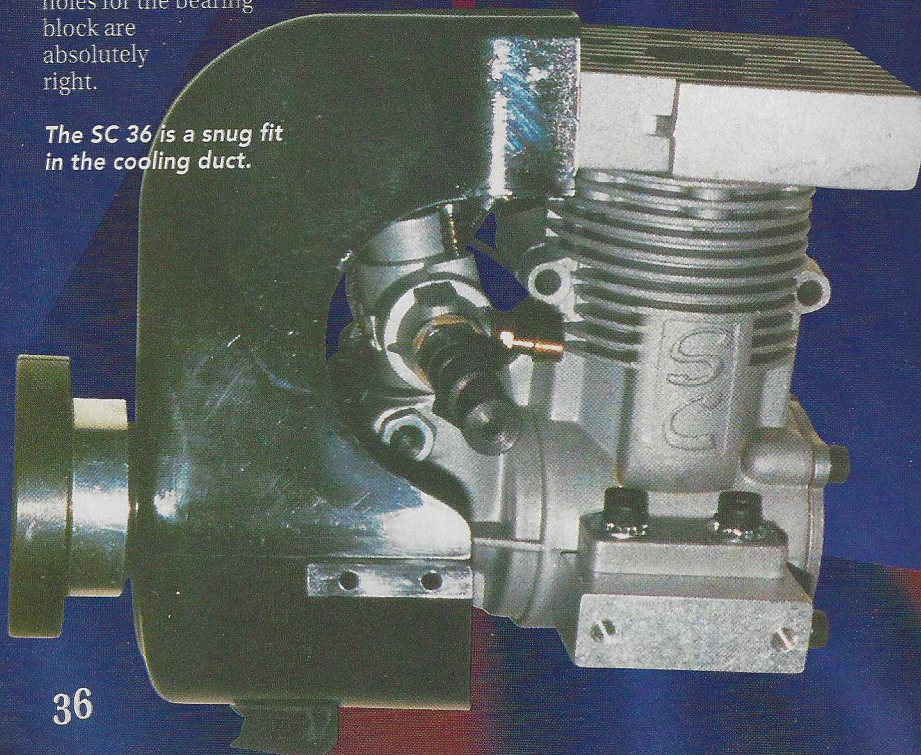
Fully ball raced aluminium clutch bell with the hex top start shaft.

that screws into the aluminium clutch bell (nice to see it is ball raced). The point here is that to change gear ratios, a new pinion is all that is needed. As the manual covers all three versions of the model, it is important to realise that where alternatives are covered, you need to follow the right one. This is easy as the appropriate sections are identified with a '2' '4' or 'E' denoting the power plant used. In the case of the clutch drive pinion, the two stroke ('2') is a 9 tooth, while the four stroke ('4') is a 12 tooth pinion.

Moving on with the clutch bell, the bearing block is handed having two holes in one of the faces, with the two stroke and four stroke, these are not used and are on the top face. The instructions are not clear about this - unless you read Japanese.

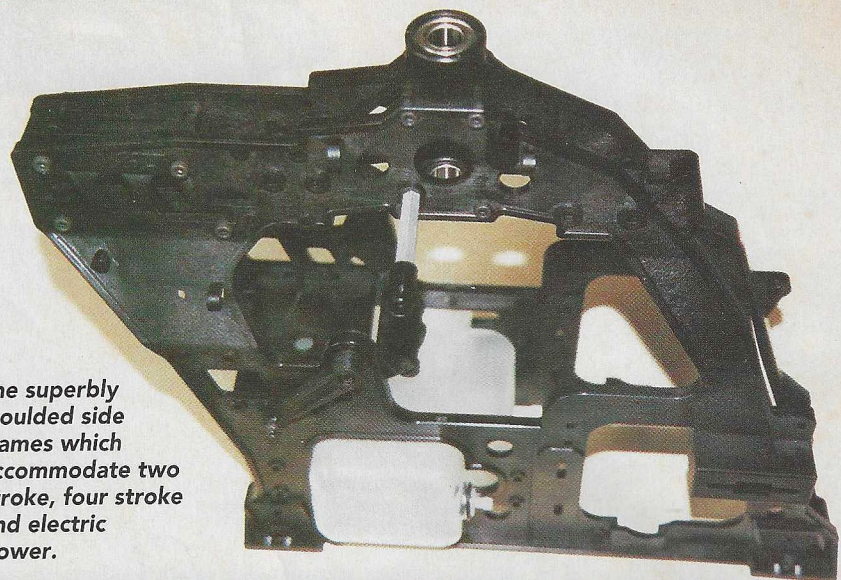
The side frames come next and these really are exquisite with strengthening ribs where needed but very light and surprisingly flexible. One point here is that the collective cradle is supported in the frames with plastic bearings which are a bit loose in the frames, these need to be tack glued in the frames as the collective cradle arms rotate inside them - the bearings do not turn in the frames. Once they are together with the collective cradle, fuel tank and mast bearings in place, the tail drive is installed and the only reason I mention this is to highlight the quality of the frames as the locating lugs and bolt holes for the bearing block are absolutely right.

The SC 36 is a snug fit in the cooling duct.



An SC. 36-H ABC helicopter engine was used in the model and assembling the fan hub caused a little headache as the hub is machined to locate on the drive flats of the OS 32 SX-H and Thunder Tiger 36 crankshaft. The SC. 36 doesn't have these flats which meant that the hub needed to be machined out so that it would fit the engine correctly. Once done there was no problem and J Perkins Distribution, who supply both the 30 Baron and SC. 36, are

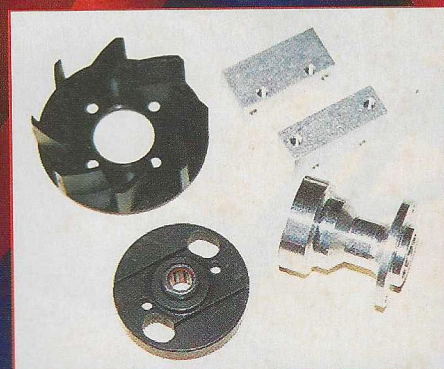
well as supporting the new elevator lever. The bolt which secures this lever needs to be left loose until the collar is fitted to the frames as it locks the collar to the frames in the right place. Putting the Mixer, Swash Plate and collective pitch rod together is covered very well with a series of diagrams showing what is right and wrong. Once done the assembly is installed into the frames with the auto rotation unit and main gear. All this is



The superbly moulded side frames which accommodate two stroke, four stroke and electric power.

now able to supply fan hubs to fit the SC. and similar engines - problem solved. Another point to mention here is that a thrust washer is needed between the fan hub and front crankshaft bearing. The fan itself is surprisingly small, 49 mm diameter, it has curved blades and is a good fit in the fan shroud, so don't worry about cooling as it works fine.

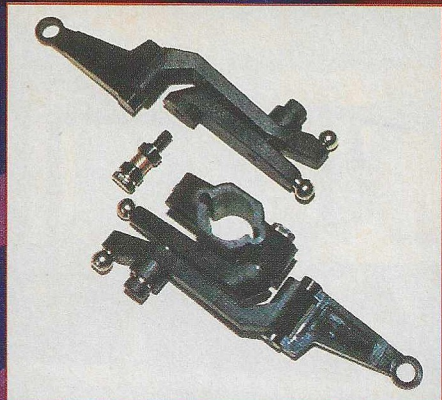
The mixer unit is the familiar Space Baron unit using plain bearings and needs assembling carefully to ensure no binding. Again the plastic Space Baron collar is used which locks the top of the frames as



One piece clutch with Spragg bearing for the top start. The fan and hub are high quality and despite the small fan diameter, cooling is very effective.

straightforward except that if you follow the book you next fit the pre assembled clutch assembly. Don't try because it won't go! The Clutch assembly should be fitted into the side frames before the mast and main gear. Alternatively the clutch assembly can be dismantled and put back together with the bearing block in situ. The gear backlash is set at this time and the diagrams show the bearing block pushed as far back as it will go for the 2 stroke and is correct.

Having sorted out that little hiccup, things progressed well with the engine installation following the fan shroud (you do need to fit the switch harness before the shroud). Aligning the engine with the clutch is well detailed. In no time at all the undercarriage, servo tray and Kalt silencer were all fitted which led to the rotor head.

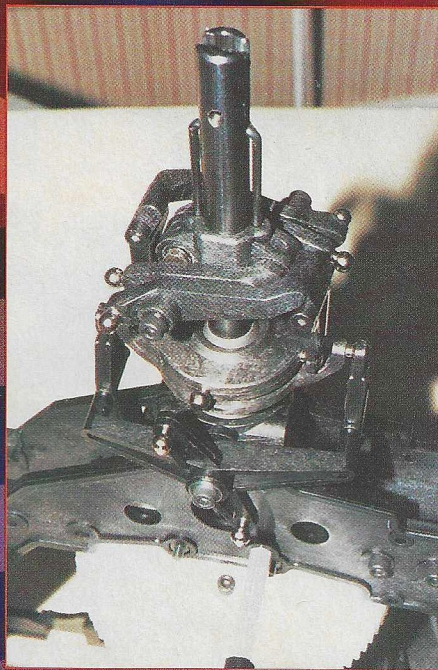


The mixer unit is the familiar Space Baron item using plain bushes and excellent metal control balls.

The rotor head

The aluminium rotor head centre block is excellent and the fit of the plastic top piece is good and tight. The flybar carrier is reversible and has three positions for the ball link that connects to the mixer unit. This allows the builder to choose the Hiller mixing ratio and the manual shows the 'N' point which is the middle position. A point to watch is that the manual shows the carrier fitted the wrong way round in Section 28, the ball should be trailing on the carrier. Plain bushes are used to support the flybar carrier and flybar itself. Two ball races support each blade grip and while no thrust race is supplied, there is clear provision for one.

Once the rotor head was fully assembled I was a little surprised to find some end float on the blade grips. The feathering shaft is held in place but the blade grips themselves slide on the bearings. This is not a problem as when the head is rotating centrifugal force makes sure they stay in the right place!



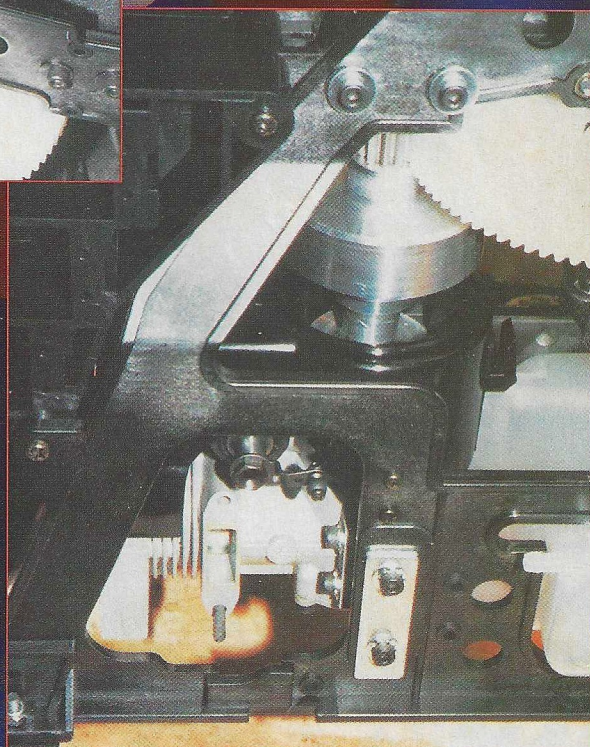
The new elevator arm with push/pull gives solid control of the swash-plate. The collective pitch control system can also be seen with the mixer base connected to the internal pitch rod.

The tail

The tail gearbox is the Space Baron unit which uses plastic gears and twin ball races to support the input and output shafts. The tail pitch slider is ball raced and the tail blade grips are also double ball raced. No surprises here, it is a good unit well up to the job, although care is needed when securing the tail pitch bell crank

as it is only a 2mm screw which can easily be over stressed. Tail drive is a simple wire with a loop at the end which slots into the tail gearbox and an adapter at the front which connects to the tail drive shaft, it is important to make sure the adapter is up against the bearing so that there is no chance of the shaft moving forward. The tail drive wire only has two plastic supports in the boom. I think two is not really enough as the original Space Baron ran with only two and they tended to move in the boom allowing the wire to whip. The later Space Baron S came with four supports which was much better.

Tail pitch control uses a wire in a tube which is supported by the tail plane brack-



Good access to the engine and the mounting points are strengthened with aluminium plates.



Aluminium mast centre with the nylon top piece. The one piece blade grips are supported on twin ball races and no doubt could incorporate a thrust race.

et and one moulding on the boom plus one point at the back of the frames. This leaves a lot of it unsupported which allows a lot of flexing under compression (i.e. when the servo is pushing the wire). I have to say that this really doesn't make much sense as Kalt have gone to the extent of providing push/pull control on the cyclic and left the tail control hanging in the air! For the beginner and general sports flyer, you are unlikely to notice any flexing in flight but the 3-D exponent will certainly find it a short coming.

Finishing off

Fitting the servos and other radio is straight forward. Worthy of note is the integral gyro mount at the rear and the moulded cable retainers for the gyro cable. Making up the various push rods is well documented as is the position of the balls on the servo arms. Equally important is the detail of setting up the model controls which is easy to follow. A point to ►

note is that the excellent ball links are a 'one way fit' on the stainless steel balls (which incorporate a stand off).

The supplied blades are ready weighted and covered just leaving the cuffs to be glued in place, they weigh 84 gm, balance was spot on and they use a symmetrical section being made from single strips of wood - no laminations! Having followed the instructions to the letter I checked the collective pitch range and found over 15 degrees at the top, 8 degrees in the hover and about zero at the bottom! Safe for a beginner but not quite what I was looking for!

I shortened the pitch rods by seven full turns to bring the pitch range down +10, 2 & -7 which was fine to start with. I then used the transmitter pitch curves to give a hover of +5 with a top pitch of +9 and -3 at bottom stick, my idea was that this would be representative of the range most sports flyers would use to start with.

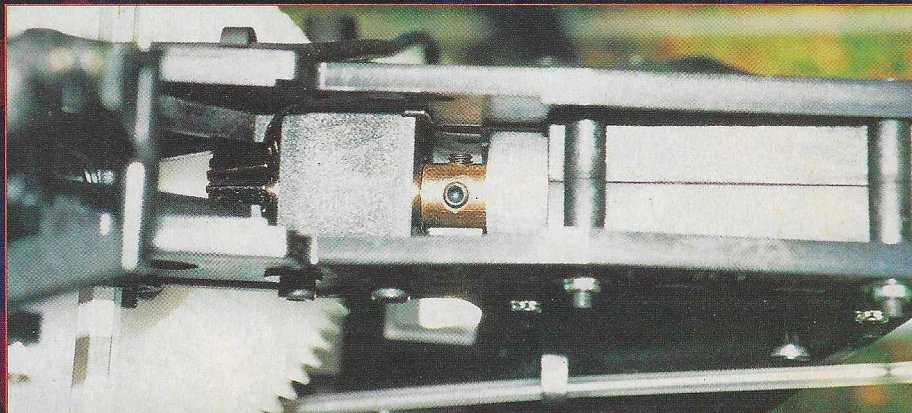
Quite a bit of trimming of the canopy was needed after which the decals were applied. A final check of the C of G showed it spot on and the all up weight (without blades) came out at a surprisingly light 5lb 14oz (2,675 gm).

Building & maintenance tips

The areas I have highlighted above and summarise below are based on the kit as supplied which included the Japanese Instruction Manual.

Tack glue the plastic collective cradle bearings in the frames.

Make sure the fan hub is the correct one for your engine.



The tail drive adapter is up against the bearing block preventing end float.

Install the Clutch Assembly before fitting the mast and main gear.

Check that the flybar carrier is installed the right way round - Section 28 shows it incorrectly!

Once the rotor head has been assembled and bolted to the mast, the mixer base may need to be adjusted to make sure that the collective pitch mechanism runs smoothly.

Once the frames have been joined check the collective lever and cradle, there may be a little sideways float in which case the 2mm screw that secures the ball on the lever may foul the side frame. If it does, cut it off flush with the nut, if you still have a problem you may need to free off the plastic bearing and re-fix so that they take up the end float.

Make sure the tail drive adapter is up against the bearing so there is no chance of end float developing in the drive shaft.

When using the 'N' position on the flybar carrier, you will find that its ball link and the one on the pitch arm can collide. If they do, put a small bend in the pitch rod so that it has clearance.

When assembling the tail drive wire in the boom, try to lock the two supports in position with a smear of silicone.

Keep an eye on the mast collar that supports the elevator lever, if it works loose the top mast bearing will move in the frames.

Flying

What a sweet model this is! Out of the box and with the pitch settings as detailed above it really is very nicely balanced with good positive controls that are also nicely progressive. With head revs of about 1500 RPM the 30 Baron is nice and stable in the hover and tail power is well balanced to the cyclic inputs.

With the flying photos in the can, gentle circuits were tried and no vices were showing at all. Faster circuits also didn't show up any pitch sensitivity which I half expected with the stock one piece wooden blades. In Idle Up quite a bit of

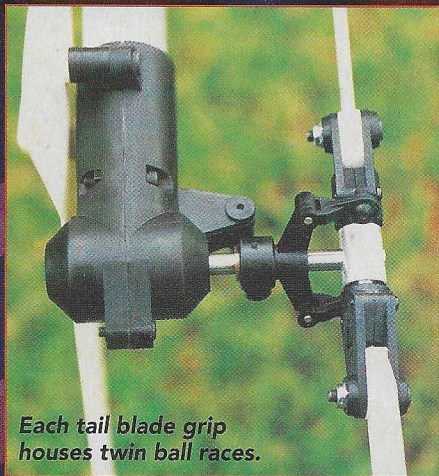
The flybar carrier can be reversed which provides two other positions for the ball link giving a choice of mixing ratios. The fly bar carrier control rod runs very close to the pitch rod and can collide.



A neat switch mount is incorporated in the frames. The collective lever can be seen with its direct pushrod to the servo.

Inside the tail gearbox. The loop on the wire drive engages inside the nylon input gear.





Each tail blade grip houses twin ball races.

left roll stunt trim was needed, along with some left tail trim, to get it to track straight and true, once dialled in it tracked very well.

Before anything more adventurous was tried, I checked the Autorotation performance with the stock blades. Again I was pleasantly surprised as the entry, both fast and slow, was uneventful and the 30 Baron kept its heading penetrating well, almost hands off. The flair and landing was very acceptable although as expected there is not a lot left in the blades so you do need to get it right otherwise there will be a bit of bump. Nothing to fear here as the undercarriage is strong and with the solid feathering shaft rotor head, you can take liberties without fear of a boom strike (something you couldn't do with the original Space Baron 'flexi plate' head!).

Next it was time to try some aerobatics. First off was stall turns, pulling up into the vertical and zeroing the pitch gave a reasonable climb and with a single rate gyro set fairly high, the turn rate was adequate but rather slow for a 540, but I tried it anyway. A nice slow 540 rotation as is slid towards earth, no big drama just a reminder to wind in some more tail throw!! With about -5 degrees in Idle Up 1, loops were nice and big and could be flown all the way round, or tightened up by pulling all the rear cyclic in and

The lengthy tail pitch control wire is largely unsupported at the front.



A helpful detail is that the canopy hinges upwards giving easy access to the glow plug.

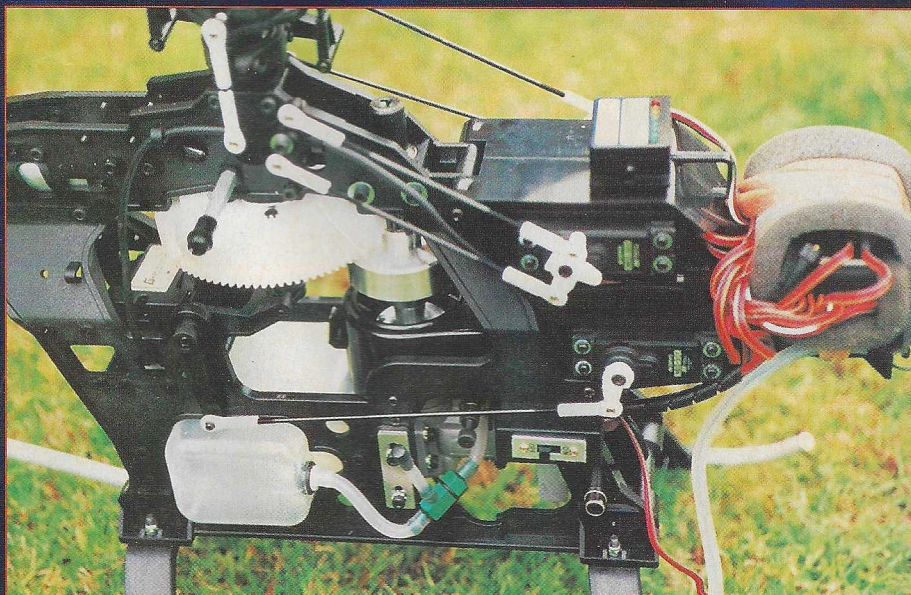


increasing the pitch to produce a figure of '9'. With the same settings rolls were

equally good and nicely axial, that is down to the model rather than this pilot's skills!

A bit of fiddling with the Idle Up 2 Pitch and Throttle Curves produced -7 degrees with plenty of throttle and now the 30 Baron was climbing inverted in the loops and with slower entry speeds quite nice flips were executed showing that even in a 'straight out of the box' trim and set up the model is both forgiving and at the same time surprising agile without needing a supersonic head speed and also without becoming twitchy. I haven't a sky tach and can only give an educated guess of the head speed through the more aerobatic manoeuvres and that would be of about 1,750 RPM on the head.

A couple of other club members tried the model out and were similarly impressed by its well harmonised controls and ►



All control runs are straight to the servos and the radio installation is simple. Note the rear mounted gyro with the moulded cable hooks.



predictability. One of the comments was "It's just like my Space!" and I guess that sums it up, the 30 Baron flies very much like the Space Baron S and it's hard to do better than that.

One point to be aware of with the model, which I learnt the hard way, is that the fuel tank includes a recess at the rear which goes between the frames and provides a larger volume. The clunk is shown as picking up fuel from the rear of this recess however this arrangement also means that the clunk will not reach the left hand side of the tank. You guessed it, with the tank running low on fuel and a left bank, the fuel runs to the side of the tank where the clunk can not follow. You have been warned!

Summing up

The Kalt 30 Baron is clearly aimed at the beginner and more advanced flyer and is designed to give maximum value in a model. For the beginner it is ideal as it has all the features which will help a new comer progress well. The design is kept simple and as already said it uses a lot of tried and tested parts. In this respect Kalt have been particularly clever as I already know owners of Space Barons who intend to buy a 30 Baron and transfer their upgrades, most of which are interchangeable.

Specification is much as I would expect for a model such as this, ball races where needed, a good choice of metal parts for extra strength, push/pull on the cyclic controls and a top start. It was also good to find good quality ball and links for all the push rods, no Z bends here! Kit quality was good, the instructions are excellent and would be superb if in English! Seriously though, the diagrams are so good that the words almost become unnecessary and I have highlighted above possible problem areas. Build quality of the model was very good and the finished model is clearly strong and can be expected to last a long time. Flight performance is equally good and it is very forgiving for the beginner and yet a very capable performer for more severe manoeuvres. Control throws can be adjusted to give more collective and cyclic response very easily. On the value for money side of things, with a UK suggested retail price of £249.95 for the 2 stroke version, you get a

lot of model for your money with options to change the model at a later date and that makes it very good.

One improvement needed sooner rather than later is four tail drive wire supports instead of the supplied two. The other area which more advanced pilots will want is an improved tail pitch mechanism, as it happens, J Perkins Distribution

are already distributing a NHP rear servo mount for the model which includes a carbon pushrod. This leads to the question of up grades and there is likely to be lots of them, however as the model comes out of the box, it performs very well and I would only up grade parts when needed, but then there are those of us who like the shiny parts and there is nothing wrong with that!

And finally...

Just as we were about to go into production, a new Instruction Manual arrived which is in ENGLISH. A read through showed that what was a very good manual is now superb. The other point to mention is that later kits will be supplied with a set of laminated main rotor blades which will require a little work to complete them. □

Jon Tanner

SPEC CHECK

PRODUCT: 30 Baron
MARKET PLACE: Intermediate 30 Model
MANUFACTURER: Kalt Sangyo Co., Ltd., Japan
UK IMPORTER: J Perkins Distribution Ltd.
 90-96 Greenwich High Road, London. SE10 8JE
 (Tel: 44 (0) 181 692 2451)

MAIN ROTOR DIAMETER: 1,249mm
TAIL ROTOR DIAMETER: 228 mm
OVERALL LENGTH: 1,150 mm
ALL-UP WEIGHT (DRY): 5lb 14oz (2,675 gm)
MAIN GEAR RATIO: 9.78:1
MAIN TO TAIL GEAR RATIO: 1:4.6
CONTROL REQUIREMENTS: 5 Servos, Heli Radio, Gyro

POWER REQUIREMENTS: 0.30-0.36 cu ins
 Two Stroke Model Helicopter Engine

CURRENT UK RECOMMENDED RETAIL PRICES:
 Kalt 30 Baron (Two Stroke): £249.95
 SC. 36H ABC: £64.95
 (The above two are available as a set at a RRP of £299.95)
 Kalt 30 Muffler: £39.95

MHW STAR RATINGS

SPECIFICATION: ★★★★★
KIT QUALITY: ★★★★★
INSTRUCTIONS: ★★★★★
BUILD QUALITY: ★★★★★
FLIGHT PERFORMANCE: ★★★★★
VALUE FOR MONEY: ★★★★★
OVERALL: ★★★★★