

The World's Leading R/C Model Helicopter Magazine

# MODEL Helicopter WORLD

January 1997 • Price: £22.95 (UK) • \$5.95 (USA)

UK FIRST! JR Super Gyro  
Good Vibrations!

WE BUILD  
AND FLY

The New  
Moskito XXL



TRAPILET  
PUBLICATION



NOEL GETS AIRBORNE!

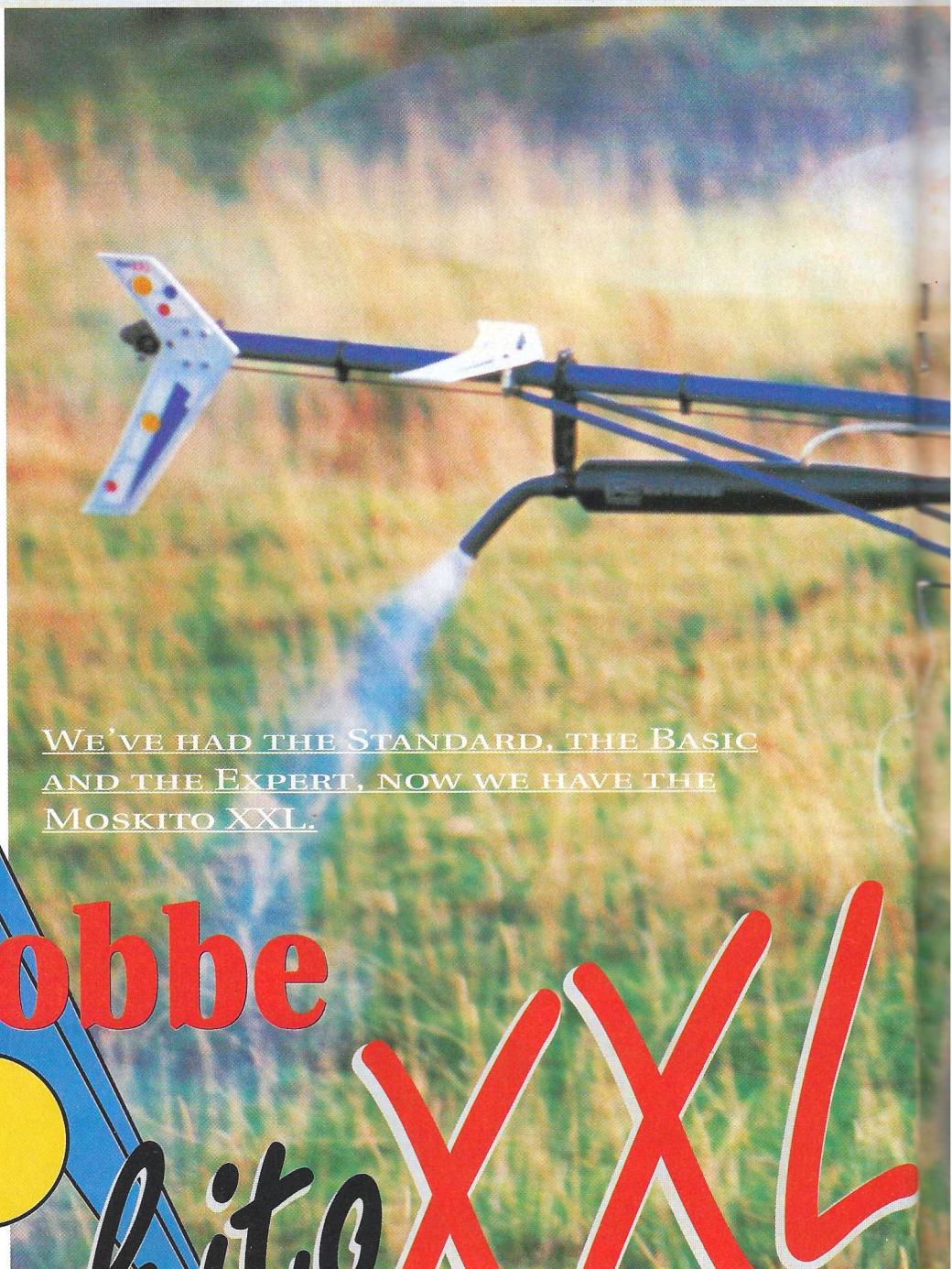
**W**hen anyone mentions a mosquito, I immediately think of hot steamy swamps and buzzing insects which irritate like mad and can make you break out in a hot fever if you're bitten by one that happens to carry malaria. If the Robbe Mosquito XXL brings hot steamy weather and buzzes around a lot, that's fine with me, but if it irritates like mad and I break out in a fever then I'm not so sure!

The Robbe Mosquito was first introduced back in 1993 with the 'standard' Mosquito which caught the eye as much for the option of the trike undercarriage and moulded pilot as it did for the mechanics or anything else. In reality the model was very innovative and well engineered, although it was pretty heavy and consequently suffered in the power to weight ratio, particularly with a '40', the number of engines that fitted was also very limited. I reviewed this original version in the January 1994 issue of MHW and that model is now with 'Half Hour Dave' who



is certainly enjoying himself with it. This 'standard' Mosquito soon developed into the Basic which was priced directly at the entry point modeller and was essentially the same but with a much lighter canopy a normal skid undercarriage. It includes a new more adaptable engine mounting system, a redesigned mast and some changes to the rotor head controls. No auto unit was supplied, which helped keep the price down, and altogether the model justly earned the reputation for being an excellent beginners model that is very strong and durable (yes it is still available and reasonably priced).

A Mosquito Expert soon joined the Basic which is a much upgraded model using more ball races and as the name suggests is aimed more at the 'expert'. This model became the mainstay of the range for the general sports flyer.



### What have we got with the XXL?

Now we've had the history lesson, what about the XXL? It's bigger, needs a 50 sized engine, is supplied with just about all the upgrades you can think of, sports a new canopy, the toothed belt tail drive has gone, the control system is much improved and yet it's still a Mosquito. This model is clearly aimed at the more adventurous aerobatic flyer with a full 3-D capa-

bility in mind, as anyone who has seen Curtis Youngblood and Bob Johnson fly them will testify.

The XXL still retains much of the original design in that the same two stage drive system is used which can be built for either rotation. A main change is that an extra gear box is included providing a tube tail drive instead of the original toothed belt. The highly adaptable engine mounting system will accommodate a huge variety of engines and the clutch and fan assembly is equally adaptable. The more popular choices in the UK are the Novarossi 50 for ultimate performance and the Webra 50 'Greenhead' for the more cautious amongst us. I chose the Webra! ▶



## KIT REVIEW

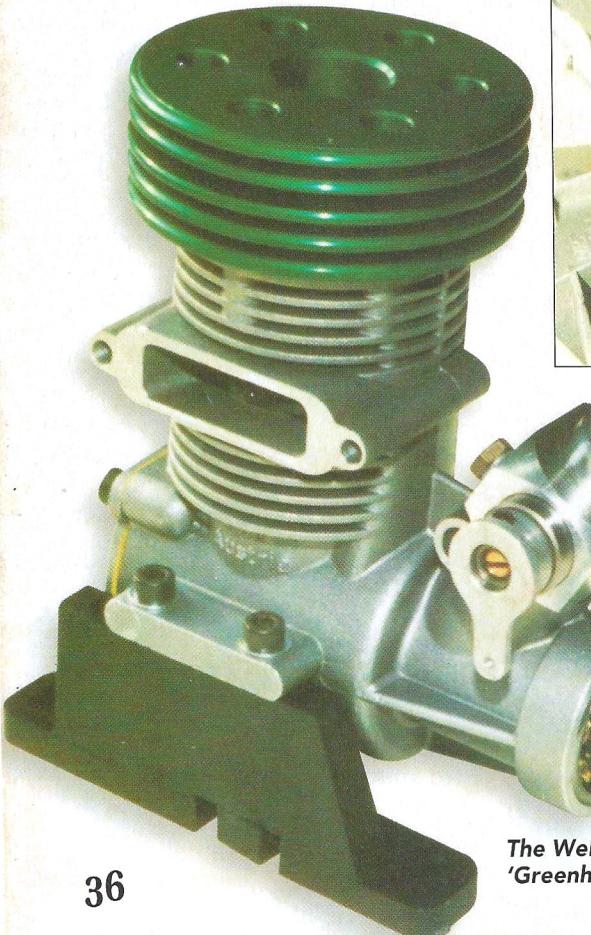
While the model uses many of the original moulded parts, there is a lot of blue anodised aluminium parts in the kit which adds both strength and precision to the model as well as to the looks. The longer boom and bigger engines means that the XXL can turn a larger rotor disc with blades up to 62cm.

### A closer look...

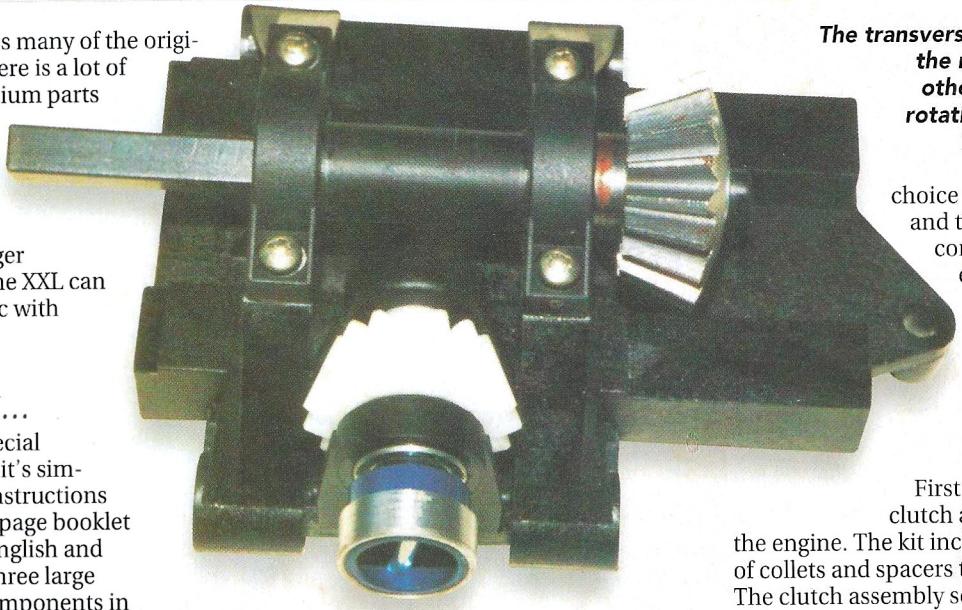
There is nothing special about the packaging, it's simply good, as are the instructions which centre on a 48 page booklet written in German, English and French plus a set of three large plans showing the components in exploded format. You also get a sheet showing recommended accessories such as radio systems and engine sets etc. plus the necessary and obligatory Safety sheet.

Included in the instructions is a glossary of terms which briefly explain some of the 'Jargon' in layman's terms as well as details of how helicopters work, such as, how lift is produced, torque compensation, controls and power systems etc. A nice touch this as it addresses some of the questions a beginner needs answers to - sooner or later...

Robbe Schluter were, I believe, the first and still are the only manufacturer to mount the engine across the model which means that the engine is upside down with the crankshaft pointing out of the left hand side of the model. This gives easy starting using a standard starter and rub-



The Webra 50 'Greenhead'.



ber along with easy access to the glow plug. The exhaust port therefore faces the rear making pipe mounting easy. The engine/clutch assembly drives a lay shaft running across the model above the engine and a pinion gear on the lay shaft drives the crown gear that drives the mast through a ratchet auto unit. Here we find



With this engine lay out a special throttle linkage is needed.

another bit of clever design work because the direction of the main rotor is dictated by which end of the lay shaft you put the pinion gear. Instantly you have a model which can either be left or right rotation, the

**The transverse gearbox. Putting the metal pinion on the other end reverses the rotation. The plastic pinion is the tail drive.**

choice is up to the builder and there are no extra components to buy either! The crown gear drives the new smaller gearbox that provides tail drive.

### The build

First job is fitting the clutch and fan assembly to the engine. The kit includes a wide variety of collets and spacers to fit many engines. The clutch assembly screws onto the crankshaft (1/4 UNF-28) up against the spacers making the positioning of the bell from the front of the crankcase variable through the use of the spacers. There is no guidance about how many spacers to use, so I used the least possible to give clearance from the front of the engine. My reasoning was simply that the less 'overhang' of the assembly the better. What I hadn't realised was that these spacers also set the position of the engine across the chassis. The position of the clutch bell gear is fixed so the more spacers used the further back sits the engine. This didn't seem to matter until I realised that the exhaust port may not line up where I wanted it. With the manifold I used (S 0947), the pipe is offset to the boom, not enough to worry about but worth thinking about! Robbe really do pay attention to details that make the builder's life easier, a nylon piston lock tool is included in the kit which makes it much easier to tighten the clutch assembly onto the crank shaft. A large set screw acts as the lock nut.

As described above, the 'gearbox' consists of a square shaft and the manual shows the assembly for right hand rotation while the text describes the sequence for both rotations (later sections show diagrams for both rotations). I did have a slight problem here as the plastic spacer that locates the ball races had to be carefully trimmed to allow correct alignment in the gearbox chassis, while the tail drive unit which also bolts to this chassis was a perfect fit.

Perhaps the trickiest part of the whole assembly is bolting the engine unit to the gearbox. As the engine mounting system is so adaptable, so is the way it fits to the gearbox which simply means that careful lining up is required - the lay shaft and crankshaft must be parallel and above each other with the two gear also lining up correctly. A bit of patience is all that is required.

The use of a ratchet style free wheel may seem rather old fashioned but they are extremely strong and reliable although a fiddle to put together. Points to watch out for are using the right pins in the right



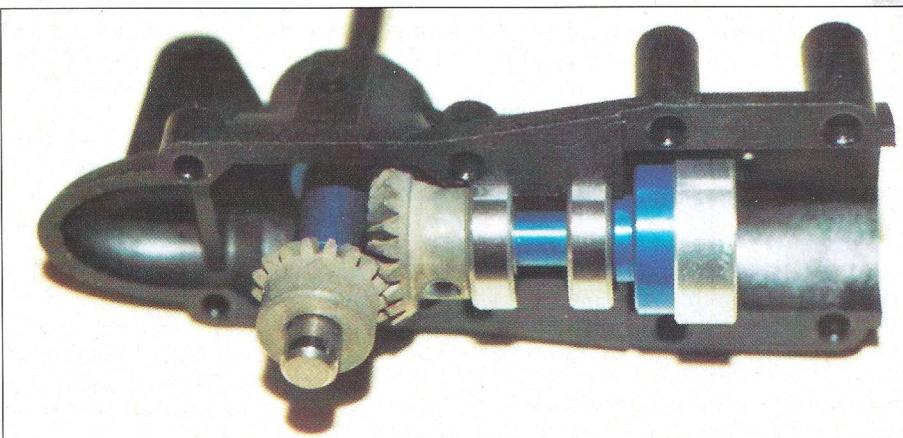
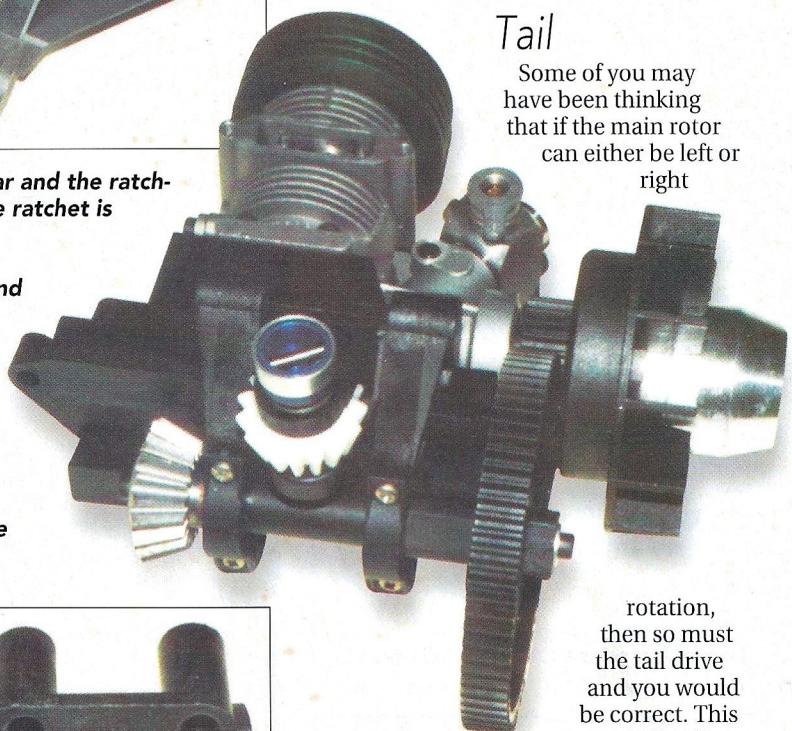
**With the mast in place, the complete power assembly is added.**



**Left: Crown gear and the ratchet auto unit, the ratchet is reversible.**

**Right: Engine and gearbox, it's important to line the parts up carefully.**

**Below: What a shame to hide those shiny blue bits away!**



**Clutch assembly, the adapter screws onto the crankshaft.**



place - there are four and they are all similar in size! Also make sure the ratchet is fitted the correct way round otherwise you end up with a right hand rotation head and left hand auto unit! With the mast in place in the excellent one piece frame moulding, the engine and gearbox assembly is bolted in place. My two observations here are that four 3 X 12mm self tapping screws hold it in place, BE CAREFUL NOT TO OVER TIGHTEN THEM, I have heard of these working loose allowing the gearbox to drop in flight. When used in plastic it doesn't take much to partially strip the thread with these screws so be careful. If this does happen, the fix is to replace them with 15 X 3 mm cap head bolts, they will NOT work loose. The second point is that the finished assembly feels very tight, this is normal and frees off in the first flight.

## Controls

Installing the servos comes next followed by the super swashplate that's supported on both sides and the rear. The various aluminium bell cranks and levers are all anodised blue and double ball raced making it a very strong and attractive assembly. These cranks and levers are all

mounted on a collective cradle which pivots in ball races in front of the mast and the right side arm extends forward for the collective pitch input. Assembly of all these parts takes a while and I did find myself having to refer to the larger drawings and parts list to correctly identify parts and how they fitted. In particular identifying which washers and spacers were which needs careful scrutiny. The end result looks great and is clearly well engineered.

## Tail

Some of you may have been thinking that if the main rotor can either be left or right

rotation, then so must the tail drive and you would be correct. This means that for

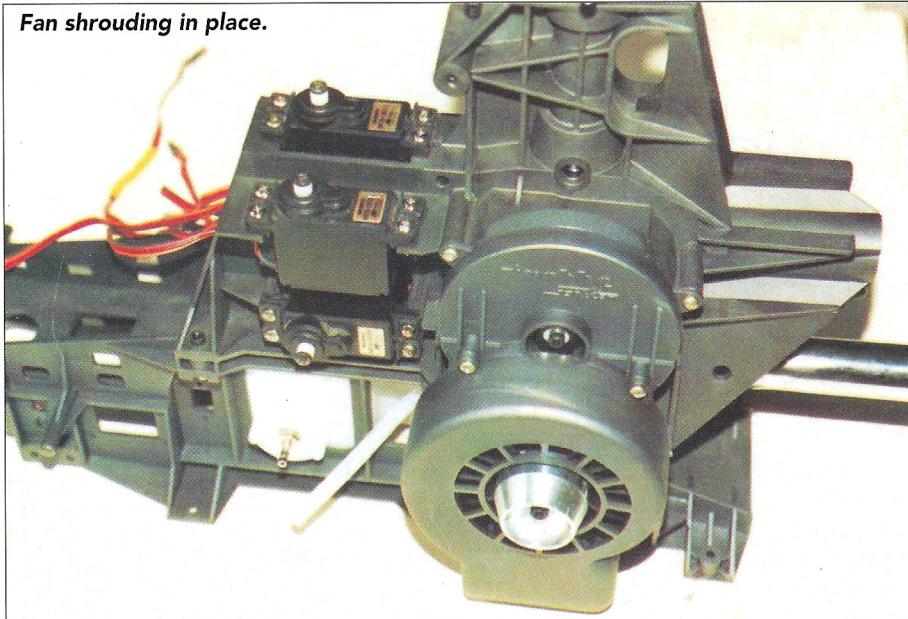
the tail rotor to always rotate in the correct direction, the tail gearbox rotation has to be reversible and it is. All that is needed to achieve this reversal is to assemble the parts in a different sequence, it's as simple as that. The tail blade holders are supported with twin ball races and the pitch mechanism is also fully ball raced. A couple of points worth mentioning here are that the 22 tooth gear goes on the input shaft and the 17 tooth gear on the output - it's a speed up box! The other point is that a little end play may develop in the output shaft in which case it will need shimming.

A first class tube tail drive is included in the kit and this uses an aluminium tube with two ball raced supports which are anchored to the tube so they cannot move in the boom. Claw coupling are used at both ends making assembly easy ensuring there are no lining up headaches. Twin boom supports are provided and these are installed with the undercarriage which finishes the main body of the mechanics.

## Controls and rotor head

Making up the push rods is straight forward however the rods are quite soft and so mustn't be over stressed because they will break. Lengths are not given but the instructions tell the builder how to square

**Fan shrouding in place.**



**Two ball races support the tail blade grips.**



**Finished tail gearbox.**



every lever and bell crank. There is no advice on the length of servo arm to use which I found a little surprising. I elected to use the standard JR arms with distances of 10.5 mm on the roll and fore/aft servos, 15 mm on the collective and tail pitch servos and 10.5 on the throttle. The diagrams show a straight arm used for the roll servo which I changed to a disc so that I could offset the balls to make the angle of the pushrod form a right angle with a line from the ball to the centre of the servo.

When I checked all the movements I found that at bottom collective pitch, when full roll cyclic was applied the roll bell cranks collided with the double links connecting the bell cranks. This would need to be checked when the final setting up of the pitch range was done.

Assembling the rotor head is a delight with all those anodised parts, ball races

and thrust races for the blade grips. The bearings are a good interference fit in the body, as are the pivot shaft bearings, care is needed to install them properly - the ones for the transverse shaft should be flush fitting. The only point to watch is to install the thrust bearing cups in the right order, the diagram gives the measurements in that the one with the 6.2 mm inner diameter is the inboard one. Two spare shims are provided for the rotor head damping so you can vary the feel of the rotor head. Another good point is that the blade grips use 4mm blade bolts.

When assembling the mixer levers collective pitch compensator etc., remember which rotation of the head you chose! Also be careful to use the correct shims in the right place, there are quite a few and only slightly vary in size.

### The rest

Setting up the pitch range is done using spacing blocks (supplied) between the swashplate and the top of the frames. With these in place final adjustments are made to the links to produce a recommended set up of 5 degrees pitch at hover with the pitch arm and servo at 'neutral'. The advice is then to set bottom pitch at -4 and top at +10 degrees. Mine came out at +12, +5 and -5 and by using a longer servo arm a full -10 to +10 degrees of col-

lective can be attained. The points to watch for are binding at full collective with full cyclic where the mixing arms can collide with the head button and as mentioned there can be some interference at the bottom. A close look at the way the links are arranged on the roll bellcranks showed that the ball for the input arm of this bell crank can be put on the inside of the arm which means that the double link angles in towards the frames eliminating the risk of interference without affecting the geometry or security of the links. This little mod is only necessary if you are likely to pull full negative (-10) and full roll at the same time.

When setting up the tail linkage, a gap of 8mm between the slider and tail gearbox is shown which set the tail blades at about 0 degrees, 12mm is nearer the mark due to a longer tail output shaft being used.

A set of weighted wooden symmetrical blades are supplied which are 585 mm long and 55 mm chord. Film covering is supplied and the finished weight came out at 115 gm. The smart canopy is supplied ready for decals and fitting. Last to fit was the exhaust and I chose the Novarossi 50 pipe using the Robbe manifold and fitting kit. The rear mounted pipe meant that the XXL came out tail heavy despite putting the Rx battery up front on the extended radio tray. Quite a bit of lead was needed to bring the balance to the mast and yet the all up weight still came out at a respectable 8 lb. 2 oz (3,700 gm).

### To the field

The first thing I noticed was that the supplied blades are a tight fit in the blade holders and it was difficult to obtain smooth lead/lag friction, this meant that with all new linkages I expected the XXL to feel a little stiff at first.

Filling the tank is easy as the filler is conveniently placed and as I was using a remote glow lead, starting the Webra was simple. One thing you do not need with a Moskito is a starter extension! With the



new engine burbling away, I opened the throttle, the clutch engaged nicely and the blades started turning, a little adjustment to the hovering pitch and hovering throttle saw an acceptable head speed and there it was sitting in a surprisingly stable hover, good enough to call Mark Ealey up to fly it while I took some photos.

After the first tank I checked the model over and was pleasantly surprised to find how well the drive gears had bedded in and that was with one tank.

Second tank and I started to explore the flying characteristics of the XXL 'as it comes'. First, it is remarkably stable in the hover, but as soon as roll cyclic was applied it responded instantly and very powerfully. The fore/aft cyclic was noticeably less powerful which made it somewhat different! The reason for this is that the elevator lever is some 50% longer than the roll so swashplate movement on roll is much greater, hence more powerful. The elevator arm has extra holes for the ball link so the input ratio can be increased by using one of these (an extra ball is needed as the existing is a double unit that has to remain). The other way to achieve the balanced control is to simply use a longer



**Collective and cyclic levers.** The fore/aft lever is longer than the roll lever and the roll swashplate link can collide with its double link: See text for details.



**The finished rotor head with pitch compensator.**

the only difference between the two set ups is the head revs! Wind the head up to about 1,800 and you have a highly manoeuvrable model while at 1,500 it is a very nice every day sports model.

### A few tips (mine plus a few from Bob Johnson)

Take the trouble to choose the right spacers behind the clutch bell so that the engine sits in the mount where you want the exhaust to be. With the manifold I used, the pipe is slightly off set to the boom.

Use a good thread lock (i.e. red Loctite) when assembling the clutch and fan onto



arm on the elevator servo, I opted for this route and the distance from the centre is now 18 mm. With this set up the XXL feels much more balanced.

When flying around you become very aware of just how powerful the tail is. The standard tail blades give a diameter of 277 mm which is pretty big and when you think about a relatively low tail rotor ratio of 1:3.88 it makes good sense. This means that as the model comes built as per the instructions you will have a head speed of about 1500 RPM and a tail speed of 5,820 rpm which, to some, may seem slow but with a big diameter it is very powerful.

When I reduced the hovering pitch and wound up the head speed the XXL became very lively indeed and it is easy to see why it is such a good 3-D model. At high head speed with the kit blades I personally

### A large and highly visible fuel tank gives long flights.

found it a bit of a handful as it seemed pitch sensitive which I think is a combination of the models newness and the tight fit of the blade roots in the grips which are also light for a model of this size. At slower RPM everything was much happier and predictable.

Next trip out and I had bought a set of NHP blades for the model, these are 620 mm with 60 mm chord and weigh 146 gm. With these attached the model really started to show its potential both as a smooth aerobatic model as well as a very powerful 3-D model, what surprised me was that



the engine, particularly with the locking set screw.

When bolting the engine and clutch assembly in the gear box, make sure the clutch pinion gear lines up with the main gear but does not touch the clutch drum.

When assembling the ratchet Auto unit make sure the pins slide properly in the hub, it may be necessary to stretch the springs that push them down to ensure they stay down! ▶



## The Robbe Moskito XXL

Be very care not to over tighten the self tapping screws that hold the gearbox in the side frames. If you have trouble with them, replace with 3 X 15 mm cap head bolts.

If you are going to run high head speeds (i.e. 1,800 - 2,000) keep the blade weight down to about 146 gm. Also consider changing the tail blades for some lighter/shorter ones as at these speeds the loading on the tail blade grips will wear the bearings.

The canopy is very flexible and the 'ears' tend to wave about a bit, Bob stiffens them up with some carbon tows on the inside, just glued in place with cyano.

If you feel the collective cradle is a little too flexible, there is available a simple aluminium tube that fits over the front cross member, it's cheap and stiffens it up a lot.

### Summing up

The Moskito has certainly come a long way in three years. The XXL has very much the same look as the original but that is only skin deep. The quality of the parts, both mouldings and metal, is excellent.

Specification of the XXL is high, as you would expect with a 'top of the range kit' particularly with the tube tail drive, all-aluminium head block, swashplate, levers and bell cranks all of which are fully ball raced. The only disappoint is that the swashplate is not supported at all four points.

Kit quality was much as we expect nowadays, the only slightly irritating thing is that some of the bolts etc. are not always in the bags you expect. The other point is that identifying some parts can be time

consuming because occasionally you have to refer to the parts list to be sure which shim, pin, spacer is which.

The instructions are very good but a bit more detail in a few places wouldn't have gone amiss, particularly in which spacers to use for the clutch assembly, the set up for different flying styles plus a few pointers about the possibility of bell cranks interfering with links. This is not a major problem as the XXL is likely to be purchased by the experienced modeller, however it looks so good and is so well engineered that a new comer could well be tempted.

The build quality of this kit was extremely good, only one part needed a bit of trimming which was the bearing spacer in the gearbox. What else can I say!

In terms of flight performance, this is a model for all comers, it has the capability of suiting every one and as such makes a super model to further your skills, no matter whether it's for general sports flying or 3-D. A model of this size, particularly with the 620 mm blades has a lot of presence about it, much more so than a 30 and it flies much like a 60, unless you wind up the head speed! As an all rounder it performs extremely well, I'm looking forward to flying it a lot more. □

Jon Tanner

### SPEC CHECK

#### PRODUCT:

#### MARKET PLACE:

#### MANUFACTURER:

#### UK IMPORTER:

#### Moskito XXL

#### Top of the Range 50 Model

#### Robbe Schluter

#### Robbe Schluter UK,

51, Sapcote Road, Burbage, Hinckley, Leics.

LE10 2AS (Tel: 44 (0) 1455 635151)

Tel/Fax: 01959 532934

#### MAIN ROTOR DIAMETER:

1,320 mm

#### TAIL ROTOR DIAMETER:

277 mm

#### OVERALL LENGTH:

1,260 mm

#### ALL-UP WEIGHT (DRY):

3,700 gm (8lb 2oz)

#### MAIN GEAR RATIO:

7.7:1

#### MAIN TO TAIL GEAR RATIO:

1:3.88

#### CONTROL REQUIREMENTS:

5 Servos, Heli Radio,

Gyro

#### POWER REQUIREMENTS:

0.50 cu ins/8.3cc

Two Stroke Model Helicopter Engine

#### CURRENT UK RECOMMENDED RETAIL PRICES:

Moskito XXL: £549.99

Webra 50 'Greenhead': £159.99

Novarossi 50 pipe, manifold & fitting kit £120.71

### MHW STAR RATINGS

#### SPECIFICATION:

#### KIT QUALITY:

#### INSTRUCTIONS:

#### BUILD QUALITY:

#### FLIGHT PERFORMANCE:

#### VALUE FOR MONEY:

#### OVERALL



# Out of this World and leading the way with robbe

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**FUTURA YOUNGBLOOD SE**

A straight out of the box model which is exactly the same as twice world champion 'Curtis Youngblood' flies. Also flown by current European 3D champion 'Bob Johnston'. Excellent for any style of flying from FAI - 3D - Scale. Rotor diameter: 1490-1550mm

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The first large Electric Trainer/Sports model with recorded flights of over 10 minutes. VERY stable due to its large size and low centre of gravity. Rotor diameter: 1480-1520mm

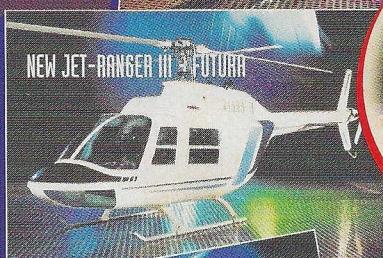


## NEW MOSKITO XXL

A High Quality/No Upgrades needed almost 60 sized model for less than the price of your average entry level 60. Tube Driven Tail/Metal Swashplate/Metal Rotor Hub/All Metal Mixers and Bellcranks/FULLY Ballraced all standard in kit. Motor size: 46-50 (50 Recommended) Rotor diameter: 1350-1400mm



THE FUTURA 1.8M GRS



NEW JET-RANGER III - FUTURA



FUTURA ROYALE



HUGHES 500 - FUTURA



HUGHES 500 - FUTURA



RH117 - FUTURA

Mini Zenit style fuselage for the Moskito Expert/XXL. Fitted in only a few hours/No painting necessary. Immaculately finished glass cloth shell. Decals included with all fittings.

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MOSKITO EXPERT



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or phone/fax: **01455 635151**



MOSKITO BASIC

This is one/if not the most stable beginners model there is. With a small rotor diameter to handle the typical British weather. It is also VERY strong with extremely affordable parts. Motor: 36-50 Engine Rotor diameter: 1050mm

# BAGNALLS MODELS

THE U.K.'S LEADING



MAIL ORDER HOUSE

BAGNALLS MODELS

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c/w Irvine 36H ..... £264.95

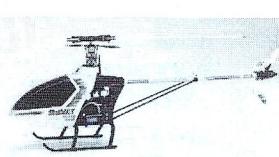


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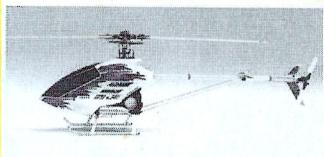
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Assembled Kit  
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JR NEJ1000 Solid S ..... £249.95

Futaba G501 c/w S920 ..... £304.00

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61 SFH R/C ..... £129.95

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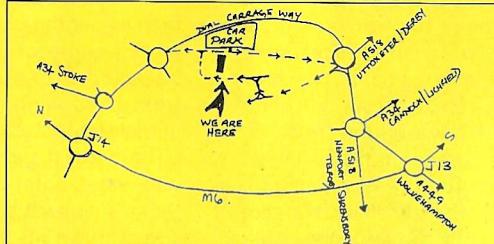
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