

# HIROBO FALCON 555

A successor to the popular *Falcon 505*, the *Hirobo Falcon 555* helicopter trainer has the ability to be fully uprated to aerobatic or scale use as the novice gains experience. DAVE ROWELL describes the construction and his first flight experiences of this impressive model.

THE HIROBO FALCON 555 is a new development of the now well established *Falcon 505*, numerous improvements revealing the *505* to be a different model altogether. Designed to accept a .40-.45 cu. in. capacity engine, the model readily accepts a .50 with very little effort. It comes with collective pitch as a standard feature and will accept all the optional extras available from Hirobo to take the *555* from basic trainer to aerobatic model.

A major point about this model that will appeal to the novice helicopter pilot, is that much of the intricate work has now been done as the kit comes with the main frame, main rotor head and tail rotor gearbox ready assembled. The main rotor head is of the Bell/Hiller type and is identical to that fitted to other members of the Hirobo clan such as the *707* and all the range of scale models. This gives a number of advantages with respect to the availability of spares, etc. Other notable points are the injection moulded stabilisers, new style lined clutch, metal mounts which form part of the main frame structure and engine mounts which now facilitates the engine group removal and

installation. Last but not least is that, with all the similarities to the other models in the range now adopted to the *555*, nearly all the additional standard features and optional extras as seen in the Hirobo catalogue are applicable to this model.

## The Kit

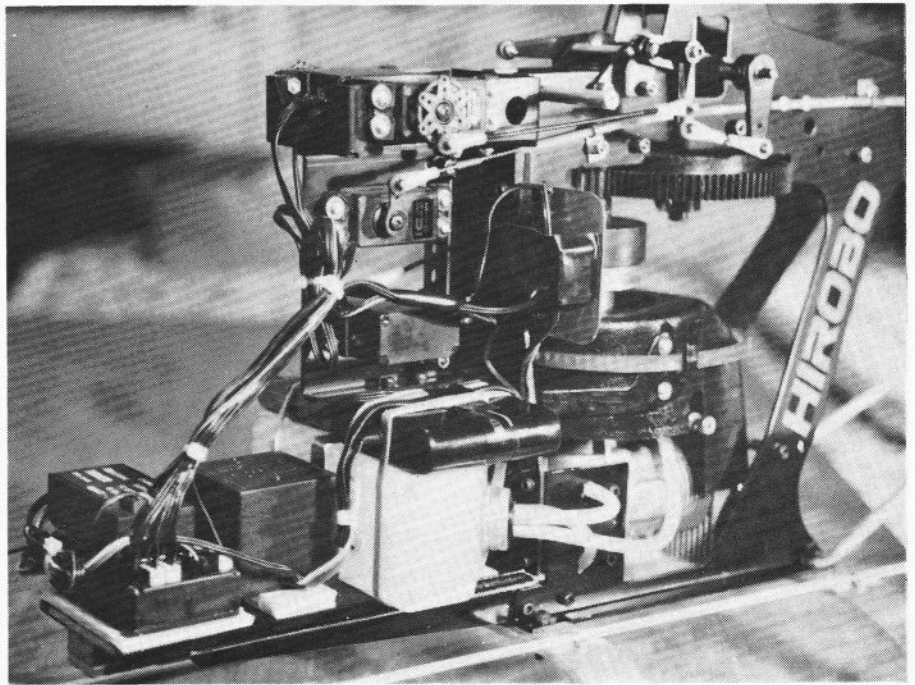
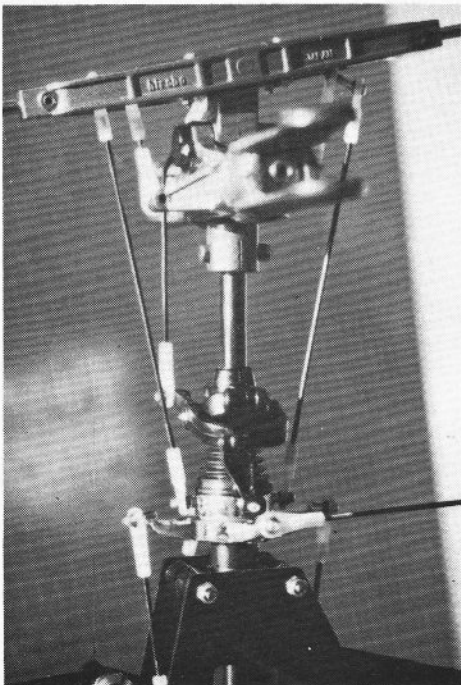
One is immediately impressed by the photographic presentations covering all the box barring the underside. This air of quality certainly continues once the box is opened, the model is well packed with all components packed in separate plastic bags and labelled according to the correct assembly sequence. Worthwhile noting, although you will not normally realise it at this stage, the kit is very complete including every nut, bolt and screw required plus fuel tank. For completion you only need engine, radio, a small amount of cyanoacrylate adhesive and decoration. Also included are some very nice decals, complete parts list, expanded view diagram of the complete model, Allen keys for assembly and an instruction manual. The instruction manual warrants mention by

itself for it is very explicit even down to having a metric rule printed on each page for the easy identification of screw sizes and eventually the accurate setting up of all the linkages. There is also a cross reference table of part numbers referring to both the large exploded diagram and the individual assembly to which each page refers. The only noticeable deficiency in fact being the normal loss in Japanese-English translation.

## Construction

As mentioned previously all the major components come ready assembled and almost ready for installation. Do, however, check these over and make yourself familiar with the operation and set-up, even down to dismantling and re-assembly if you feel the need. So, having now thoroughly acquainted yourself with the instruction manual the assembly may be started. This begins with the addition to the main frame assembly of all the linkage bellcranks, etc. from pack 'A'. Pack 'B' then follows with the front section, pack 'C' the engine and clutch and so on until pack 'K' which in theory finishes the model by the fitting of the cabin and canopy.

Below left: the rotor head of a helicopter is often considered to be its heart. It looks complicated to the newcomer but the *555* instructions make it all clear. Below right: one of the *555*'s best points is the simple layout of the mechanical and radio systems. The light metal plate above the Ni-Cad packs was added by your reviewer to carry the radio and tail gyro switches.



As the model is assembled almost completely as a bolted-together construction kit (like Meccano and just as easy) and the instruction manual is so easily understood, a blow by blow account of the construction is hardly needed. However, during the assembly there were a few incidents worthy of mention which will assist the reader in the construction of his or her own model.

The first minor problem I encountered was due to my choice of engine. With thoughts of long life and future applications to the basic helicopter, I chose an OS 50 FSR-H. This, being slightly larger than a .40-.45, meant a slight amount of filing to the engine mounts was necessary to accommodate the additional size. Other than this no extra work was involved in the fitting of the engine and clutch assembly to the main frame. Worth mentioning at this stage, is the fitting of the cooling fan and starter pulley to the engine crankshaft. When you are satisfied that this critical alignment has been achieved, remove the fan and pulley, smear a spot of Loctite between the two and on the threaded portion of the crankshaft and reassemble. Check the alignment once again and when OK fully tighten the crankshaft nut.

No further problems were experienced with the main assembly, all the parts going together quite rapidly. The only other problems encountered were that the four screws supplied for fixing the vertical tail blade to the tailboom were of the wrong size and that the drawing showing the cranked link connecting the stabiliser bar and the swash plate is incorrect. It is not possible to achieve the dimension between centres with the link formed as shown. The bend in the link should be either of a shallower angle in the indicated place or located 10-15 mm from the end instead of 20mm as shown. Either of these modifications will allow the link rod supplied to be used.

Do take care that all these links are all made up accurately with the lengths as shown. Set correctly they will guarantee that the basic set-up will be ready for flying.

With all the metalwork completed we reach the only 'modelling' work necessary, the fitting of the floor plate (mechanical plate in the instructions) and the completion of the main and tail rotor blades. Firstly the plywood floor plate is covered with a heat shrink material supplied in the form of a tube and a wooden block is then glued to the front underside to form a fixing point for the cabin. The floor plate is then fixed to the front stays with wood screws and becomes the base to which is attached the supplied fuel tank, radio receiver, Ni-Cad packs and gyro if one is to be used.

Lastly the blades. These only require light sanding with a fine grade of paper until a good smooth finish is obtained. Then, prior to covering with the supplied heat-shrink tube, each end of each blade is painted to seal and protect the wood. The blade is then slid into

the tube which is shrunk with a heat gun to produce a good smooth finish, the plastic is trimmed from each blade end and then the plastic edge is sealed to the blade with a small amount of cyanoacrylate adhesive. This done, all that remains is to balance the blades. Whilst the instructions do indicate how this should be done, a visit to your local expert to seek his advice will definitely pay dividends.

Like the cooling fan and starter pulley alignment, balancing the blades is absolutely essential if you wish to avoid vibration and possible failure of your model.

Having now in theory completed the mechanics of your model, stop for a short while and check that everything is set as per the instructions. Check all moving parts for freedom of movement, there should be no binding anywhere in the main or tail rotors' drive or control systems. Check all the linkages and ball joints individually again for free movement but no excessive play.

As a final note it is essential to use thread locking compound throughout the construction. A word of warning though, do not allow any to get into any ball-joints or they will seize up, or onto any plastic components, as some forms of plastic melt.

## Installation

Installing the radio in this model presents no difficulties whatsoever. It is designed to accommodate either a four or five servo set-up, the optional fifth servo being used as an independant collective pitch control.

All the servos are mounted in the front main frame assembly. Use of the servos is as follows: 1. Forward and reverse (elevator). 2. Left and right cyclic (ailerons). 3. Tail rotor (rudder). 4. Throttle and collective pitch combined. To ease the fitting of any make of servo the bearers are fully adjustable for length, different widths of servo are accommodated by the use of elongated holes. It was a nice touch to find all screws and nuts necessary to mount the servos supplied with the kit as well as all the ball joints, etc.

The receiver, Ni-Cads and gyro that I had decided to use (any assistance I can get to help my learning process was considered worthwhile) were fitted to the floor plate, using several thicknesses of double-sided

Below: this Heath Robinson-ish looking arrangement is the system through which collective and cyclic pitch control movements are transmitted to the rotor head. The instructions give the exact length of each linkage member and the direction and distance they have to move to give a specific control effect. Right: tail rotor assembly. This is the simplest linkage of the lot, for it can be seen to work like a variable pitch prop.

servo tape. This then left the switches to be fitted. After due thought an aluminium switch plate was made up to accept both the radio and gyro switches and attached to the main frame using two vacant screw holes. This allows the cabin to be removed easily. This done, all that was left was to tidy up the wiring using a few small tie-wraps and make a small hole in the cabin floor to allow the aerial to be threaded through.

With all the radio gear now in place, all linkages were connected and checked for free movement. Make sure all servos have the correct rotation (mistakes occur at the best of times) and finally do make sure that everything is securely fixed in place, again using Loctite where necessary.

## Finishing

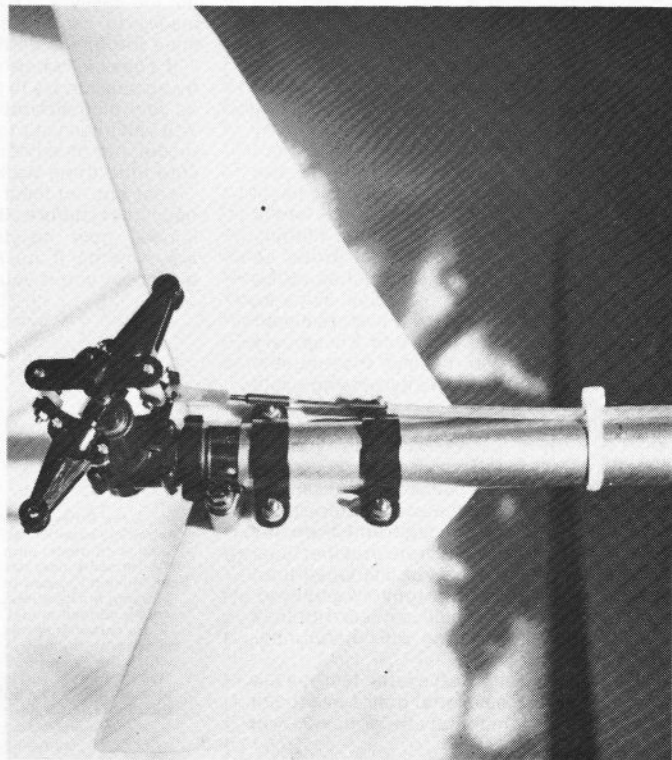
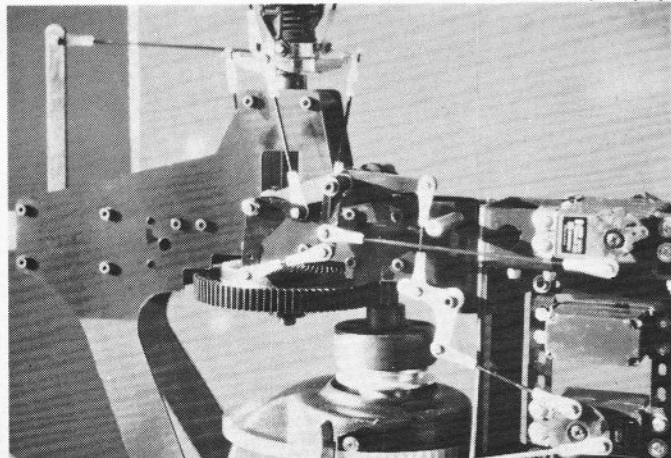
Unlike your average fixed wing aeroplane, very little finishing is required. Two points to watch with the painting however, one is to lightly roughen the glassfibre cabin with fine wet 'n' dry to form the key for the paint, secondly beware of using any paint that will attack polystyrene foam when decorating the stabiliser fins.

## Flying

Flying a helicopter is just not like flying a fixed wing model, this must be fully realised and appreciated. For even the most experienced fixed wing flyer, it is probably best regarded as going back to your initial learning days. So, even if it is with tongue in cheek, seek advice and tuition for it is the safest and least costly way of learning to fly your model. Without exception, all of the shops in the retail trade that now have any significant involvement in helicopters will offer just such a service.

A phone call to Dave Nieman Models at Sudbury was made to arrange to have the model checked out, any mistakes made known and rectified and if possible test flown. As well as being the closest helicopter specialists to myself, Dave Nieman Models are also the importer and distributor of the Hirobo range of models.

I duly presented myself together with model at Dave's premises. Fortunately I had made no serious errors (the model — Dave's words — being almost idiot proof) with a few minor adjustments to the linkages the model,



although slightly nose heavy, was declared ready for flight testing.

With the engine duly tuned to his liking it was only seconds before the model was airborne, proving the accuracy of the set-up as per the instructions. In the ten minutes during which the model was flown it was tried with both gyro switched in and out, flying during this period was described as 'Hands Off'. With the initial test flying now completed, the only fault apparent was the alignment of the engine starter pulley being out and causing excessive vibration. The use of a dial gauge or a simple pointer, will make any displacement obvious as the engine is rotated.

The next stage of flying was now up to me, with pulley re-aligned and batteries re-charged the next flying opportunity was eagerly awaited. With the weather bright and wind fairly steady, the day arrived. Amidst a number of onlookers from my club the engine was once more fired up, then with model and transmitter in hand I proceeded to a position on our field allowing plenty of space. Then, remembering what I had been told and advised, the throttle was slowly opened until the model was just lifting. Now holding the model into the wind with the tail rotor and as level as I could manage with the cyclic controls the throttle was opened fractionally more. Lo and behold she was off, not to any great height or for any length of time as I chickened out and closed the throttle, but she was flying. During my first session the best I achieved was about 30 second flight whilst going slowly forward and, although nothing to shout about, was certainly felt to be an achievement, especially as I finished at the end of the day with no serious damage. During the session the model was tried both with and without the gyro and it was very evident even at this early stage that stability is much improved with the gyro being used.

## Points to note

As in all types of flying, practice makes perfect the only difference with helicopters being that more practice more often is required. I have been advised and from my experience I am sure it is true, that if at least two sessions a week can be managed then overall confidence can be rapidly achieved. But do stick to it, you will not learn to fly a helicopter by only devoting one half hour per month.

A number of things have been learnt even during the few sessions that have been completed and which may be of use as you progress.

Do make sure all safety rules on the flying field are strictly adhered to, for a 50in. rotor at speed can be extremely dangerous.

When transporting the model disconnect the linkages between the main rotor blades and swash plate (the ones controlling pitch) to prevent straining of the linkages and hence any trim change or damage.

With the links removed fold the main blades rearward and secure them with rubber bands to the horizontal stabiliser.

Before flying, always ensure there is adequate fuel in the tank and monitor the duration of the engine run, engine failure whilst in the air is not to be desired at this stage.

Do try to fly from a flying site that is fairly smooth and short cut. Long grass will interfere with the rotors and prevent full control on take off or landing and can easily result in the model tipping over or catching at the tail end.

Makes sure that the servos holding the blades are not over tightened. All blades should be capable of moving in the head but not too easily. Purpose of this is to allow the blades to centralise with centrifugal force once the heads are rotating.

If possible when going out for a practice flying session try to do so when there will be as few distractions round you as possible. You will need your total concentration on the model, not on what the kids are doing or that cute little thing walking the dog.

Last but not least if you have not flown a helicopter before do have someone who knows how to try it and make any adjustments if necessary. It will be much easier for you if you know that it will fly.

Dave Rowell is an extremely experienced fixed wing model pilot who for some time has been looking forward to trying his hand at a rotary winged model.

He certainly seems pleased with the way in which the *Falcon 555* went together and is pleased to say that all the flights so far have been extremely enjoyable.

## Summary

I have developed a great affection for the *Falcon 555*. It is a quality product from the Hirobo stable with the only limitations to its flying ability being those of its pilot. Do remember though that a helicopter is a far more complex machine than most fixed wing aircraft and consequently requires more attention paid to in-between flight checking and maintenance. Provided this is adhered to the model will respond with endless hours of flying pleasure.

Always remember though when the training sessions are over and your confidence is built up the way is open to you to progress to aerobatics or scale with any of the proprietary glass fuselages available. Hirobo will provide any parts you require for these, the choice is yours.

A note of thanks must go at this point to all at Dave Nieman Models for their assistance in the initial stages of getting the model trimmed and airborne, although they do stress that all their customers are treated in this excellent fashion.

So, if my success and enthusiasm stir you into action do give this model a great deal of consideration. It might not be the cheapest kit on the market but for the quality and versatility the value for money is extremely high.

Another thing I can thoroughly recommend which I have found of great assistance is the gyro which is well worth a raid on the piggy bank.

Distributor: Dave Nieman Models, 34 Watford Road, Sudbury. Price: £265.00.

