



**KIT
REVIEW
No. 84
by
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Graupner BELL 47G

GRAUPNER'S Bell 47G helicopter was a talking point of last year's Nuremberg Toy Fair, where it was first revealed to the modelling world.

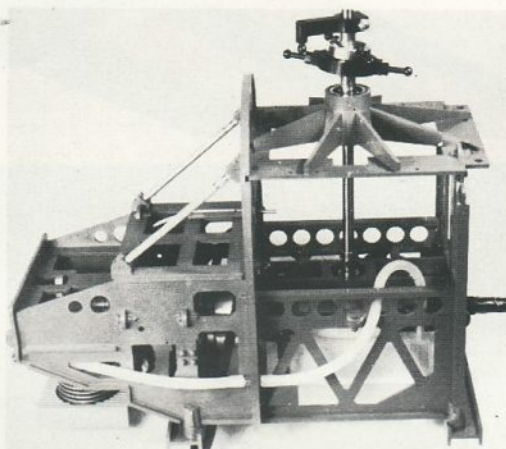
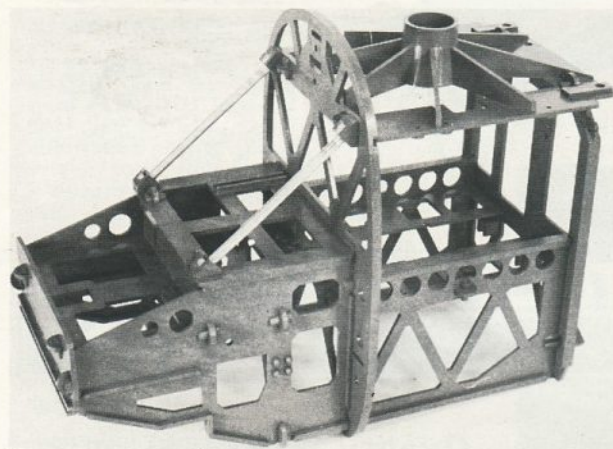
What made this model such a sensation at the time was its clip-and-slot-together construction method using ABS moulded components. The model is certainly handy sized. The rotor diameter is only 37½ in. and the overall length just 48½ in. Additionally, the model employs a purpose-made HB25H motor specifically for R/C helicopter operation with integral heat sink cylinder head.

At Nuremberg, Graupner display stand assistants were seen slotting basic fuselages together from the ready made parts in a matter of minutes.

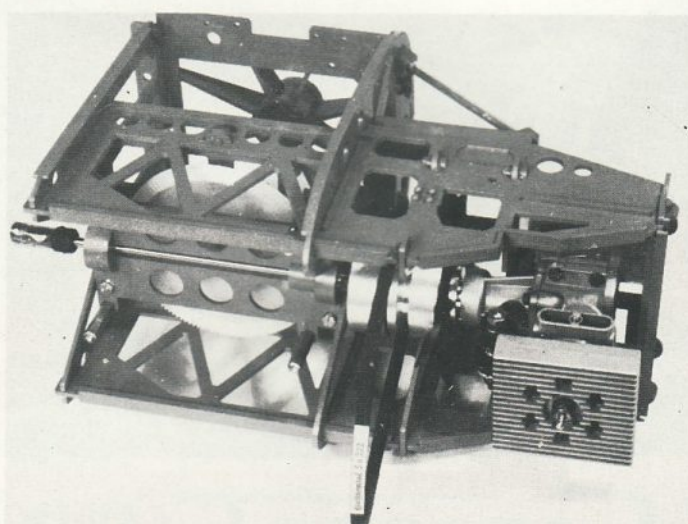
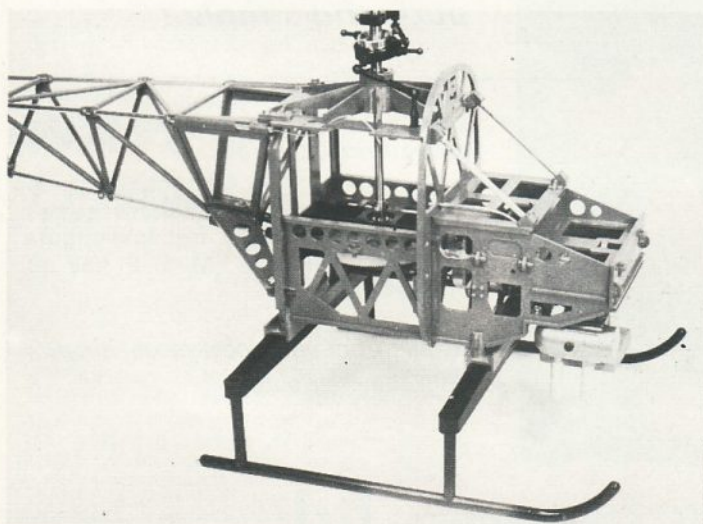
Since its Nuremberg debut, the Graupner Bell 47G has undergone significant detail development, so that production kits have subtle differences from the pre-production sets of parts which we received at the middle of last year and final receipt of definitive English language instructions, plus additional instruction addenda sheets from the British distributor, including details of radio installation for other

than Graupner radio equipment, now make an examination here a practical proposition.

At the outset it cannot be over-emphasised that perhaps the most important requirement for success with this little model is the **CORRECT ATTITUDE OF MIND**. We deliberately mentioned the demonstrations of speedy superficial assembly because it is these we feel can lead the intending modeller into entirely the wrong approach to construction of this model. Despite use of apparently automatic alignment techniques, assembly of the Bell 47G should be regarded as every bit as much a



Far left: basic front fuselage structure, note method of joining components with lugs and wedges. Left: basic structure, motor, main rotor drive, swash plate, fuel tank and fuel lines fitted. Below left: tail boom and undercarriage fitted. Below: view from below of motor and main nylon drive gear, note direct drive shaft to tail rotor.



technical construction exercise as for any R/C model helicopter currently available. Take advantage of the simplification offered by all means, but nevertheless, give every construction stage the undivided attention it both deserves and requires.

Having now put together no less than four of these airframes we are quite convinced that the foregoing is by far the most important message which this review must bring. The German and English instructions sheets, used together, form an entirely adequate instruction manual, to which we will only add emphasis to areas and points of individual difficulty and potential problems.

Step by step building instructions and building sequence illustrations are very good and I strongly advise that these are studied at length before attempting to construct any part of the model. I would also stress the point that *only* the glue supplied with the kit should be used on the ABS material, as some plastic glues have a detrimental effect, turning the plastic brittle and so weakening the joint areas. All joints should be thoroughly degreased before gluing and all ABS joints lightly sandpapered.

The interlocking spars of the tail boom are so designed that each part holds its neighbouring part firmly in position. Two of the three alloy longerons of the tail boom have secondary uses: the lower one, in fact, is a tube through which passes the rear rotor drive shaft; and the upper right longeron, also a tube, is the guide for the rear rotor pitch control cable. Keying points on the lower longerons are glued with Stability Express, not supplied in the original run of kits but included in the latest batch.

The engine, cooling fan, starter belt pulley and clutch plate are factory assembled as a complete unit, and a point to note here is that the small metal alignment tube, a slide fit into the centre of the clutch, is a centring aid for accurate alignment of power unit and clutch bell assembly. *This must be removed when alignment is complete*, after engine bearer plates are firmly glued in position with Stability

Express, as to operate the model with the tube in position can cause damage to the clutch assembly. Removal from, and reinstallation of the power unit into the completed model is made easier if two adjacent cooling fan blades are removed.

When fitted, the forward edge of the cockpit canopy base is very close to the engine cylinder head, rather too close to allow an adequate flow of cooling air across the engine. I would advise the removal of at least half an inch of the plastic base just forward of the engine to ensure satisfactory engine cooling. While on the subject of engine cooling I would warn builders not to omit the narrow air director shroud which fits to the fuselage around the engine cooling fan and to periodically examine the fan blades for security and damage.

When preparing the fuel tank for fitting, do not overlook the instruction regarding the bevelling of the inner end of the metal tubes to avoid fuel flow restriction, and do fit a filter in the forward part of the fuel tube to the engine.

Carefully balance the flybar and paddles. This unit is of solid plastic construction and careful drilling of small holes in the outer edge of the heavier paddle is the method I have successfully used.

Rotor blade balancing and adjustment for blade tracking are clearly described in the building instructions.

Having built the model, you will no doubt be anxious to get it airborne. Be patient. If you have no experience in flying model helicopters, I strongly advise that you enlist the aid of an experienced pilot to flight test the model and pass on a few flying tips. If you must fly it yourself... well, as they say, this is where the story really begins.

Firstly, if you have not done so already, construct the helicopter stand described in the building instructions. Rather than an 'optional extra', this is really *absolutely necessary with this model* because it is *essential* that the rotor blades are free to rotate during the engine starting procedure and the only safe way of allow-

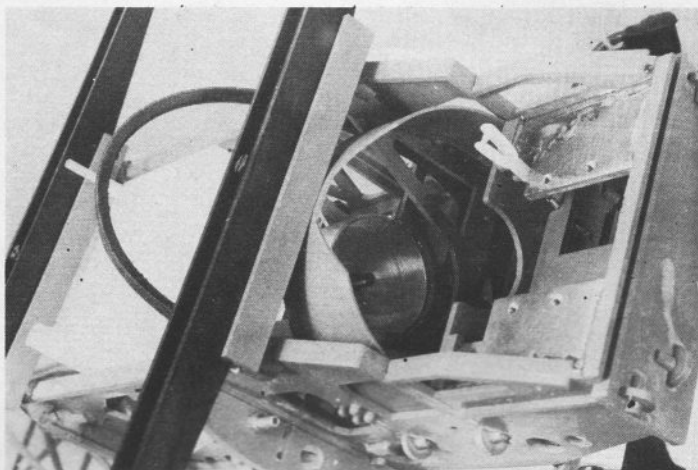
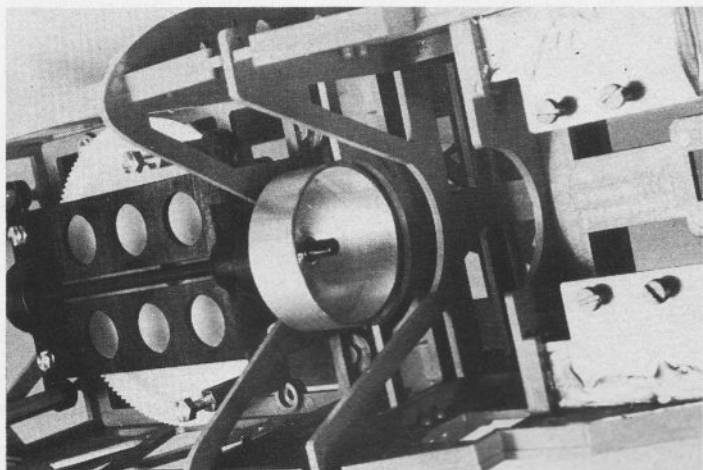
ing them to do so is to position the model safely above head height. The motor must be well 'run-in' before attempting to fly the model. The manufacturer advises using at least three full tanks of fuel with the engine running at approximately half speed on a 'rich' fuel setting. An electric starter must be used on this model and, as the r.p.m. of most starter motors is quite high, it is possible for the centrifugal clutch of the model to engage and spin the rotors as soon as the starter motor is used *and any attempt to restrain the rotors may cause damage to the transmission gears*.

Having started the engine (on a low throttle setting), the fuel mixture for full power running is adjusted under full load, by applying full tail rotor control. Thereafter, the idle is adjusted on the Perry carb. until the motor runs reliably at idle with the clutch disengaged. If this is difficult to achieve, then suspect a 'tight' engine and allow the motor more running-in time! Always wait for the rotors to stop of their own accord before lifting the model to the ground.

If you are a beginner, I strongly advise that you purchase and fit the float kit. On my own model, one of the early pre-production component sets (the review model is one of the more recent kits), I have extended the undercarriage cross members a full five inches. I am still in the 'learner pilot' bracket and found the undercarriage, even with floats fitted, a little too narrow for my liking. For extra safety, when starting the engine, I remove the main rotor blades and do not replace them until the engine is ticking over with rotor drive stationary.

The building instruction booklet contains a section dealing with "Flight preparation and test flights". Do read it carefully, as it contains a great deal of essential information on such points as the correct C. of G. position, starting and adjusting the motor, adjusting rotor blade tracking, etc., and many very useful helicopter flying hints for the learner pilot.

This concludes the building review. We follow on next month with the flying tests.



Above: close up view from below, note guard around clutch housing which prevents starter belt moving rearward from drive pulley. Above right: underside close up view showing undercarriage fitting and circular fan housing which must be fitted for efficient cooling of power unit. Right: simple method of main rotor blade connection to rotor head. Far right: rear rotor gear box, note control arm, and control rod which passes through centre of gear box to rotor blade arm.

