The SCHLUTER Magic

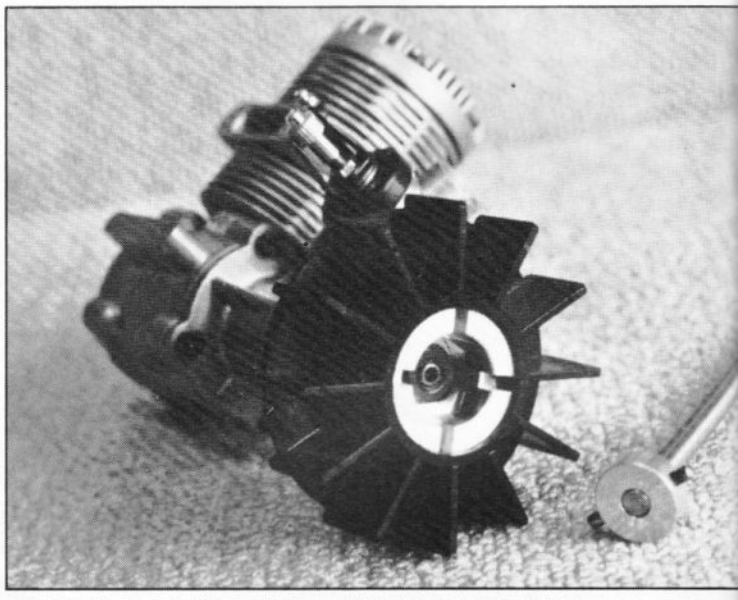
Nigel Ashwood introduces the Schluter Magic

Prior to a more in depth review of this new offering from Deiter Schluter's drawing board, Nigel Ashwood has come up with a brief but informative article, based on his experience with the latest technology to come from West Germany. He couldn't resist snapping up the first example to arrive in his shop, what follows is a frank and honest opinion from a knowledgeable builder and flier.

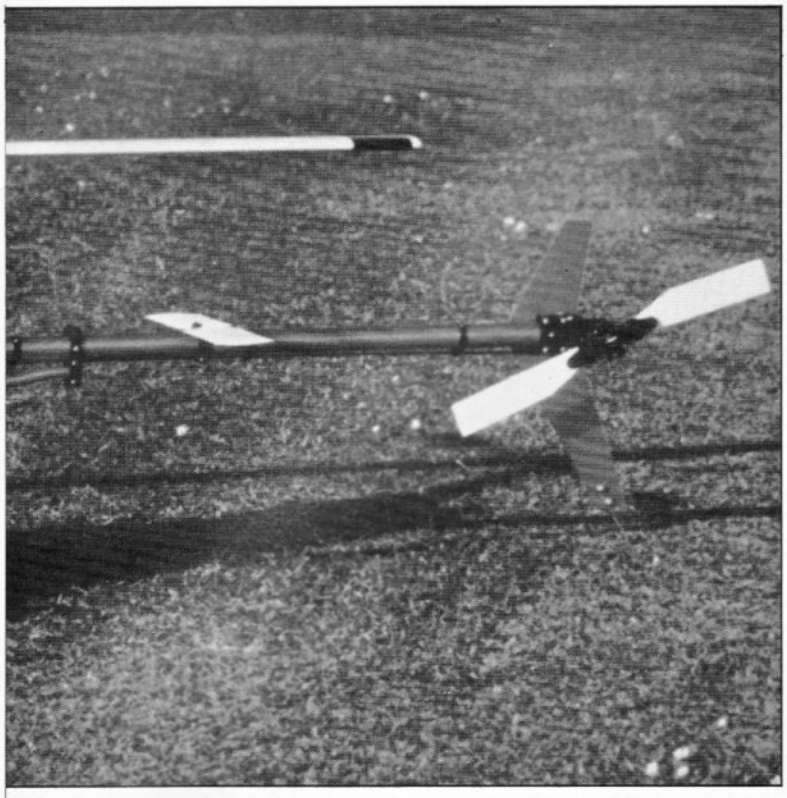
Schluter's latest offering, the "Magic" does, at first glance look like a modified Scout; however, nothing could be further from the truth!

The only major items carried over from the Scout are the head, undercarriage and swashplate. The Magic is a much larger machine, having a main rotor diameter of 1490mm. To cope with this, the engine to head gear ratio is 10 to 1. It is in the gearing that Schluter depart from their normal practice of a single gear train and instead have adopted a two stage system in which the final gear features a removable bevel tail drive and internal teeth. The final output gear sports a redesigned autorotation unit which has two roller one-way bearings and two ballraces instead of Schluter's normal ratchet system. The gear train is assembled into a very robust cassette type framework for rigidity, this also carries the starter shaft which drives the fan/clutch assembly via a dog type coupling. The shaft is spring loaded so that as soon as the starter is removed, the shaft disengages from the engine and stops revolving.

My experience confirms that the drive train modifications have led to a decrease in vibration. There is no sign of fuel frothing but the familiar Schluter gear noise still persists. The engine must be a helicopter type, i.e. one with a long parallel crankshaft nose (a Webra/Heim type was used in this review). It is now mounted on machined alloy engine blocks instead of the crude folded steel mounts used on previous Schluters. One problem associated with shaft start engines is obtaining a perfectly true running clutch and start shaft assembly. The fully ballraced clutch simply sits on a tapered collet and runs perfectly true. Two sizes of collets and



New arrangement for disengaging the starter shaft (after starting), seen here fitted to a Webra/Heim .61. This new feature does away with hours often spent on clutch alignment.



The slightly aggressive appearance of the Magic gives a hint to its fine aerobatic performance. The rotor disc is larger than previous Robbe/ Schluter models.

various spacers are provided to suit different types of engine. As mentioned earlier, the start shaft is a separate item that engages only while starting so this does away with a major stumbling block for the builder.

The tail rotor gearbox is all new and represents a great improvement. The 2mm wire pitch change rod passing through a hollow output shaft has gone, to be replaced with a ballraced slider running on the outside of the output shaft. Another welcome change in this area is the external grub screw that locks the tail drive wire into the gearbox input shaft. In the old Schluter tail boxes it was impossible, for obvious reasons, to replace a tail drive grub screw properly without having to strip the entire box to remove all the grease. The rigid and accurate tail blades are mounted in tail grips that feature one journal ballrace and one thrust race. With a head to tail ratio of 1 to 3, I had misgivings as to whether the slow tail RPM would have enough power. However, after at least a dozen flights the system certainly seemed to be adequate.

The red anodised tail boom has a brass tube fitted to carry the tail drive wire thus providing a whip free set-up. Another welcome improvement is the clamping arrangement for the front of the tail boom between the main frames. These clamps have registers that are pefect fits in the main frame cutouts providing extremely accurate location.

Schluter's servo and radio mounts used to be made of wood, the Magic's mounts are robust plastic mouldings which cuts building time considerably. Access to the gyro and the throttle servo can be a bit of a problem, so it is advisable to install these on the bottom plate before adding the top and side mouldings.

The main rotor blades follow the normal Schluter practice of being laminated wood with wooden root reinforcements already bonded in position and drilled to take brass bushes. The blades, with covering weigh 185 grammes each which, in my opinion, is quite heavy enough for good autorotations therefore I resisted the temptation to add tip weight.

The only other point concerning construction is the cooling shroud extension which is vacformed in clear lexan and is supposed to be C.A. glued to the fan housing. I elected to use screws through rubber grommets to facilitate easier removal and to avoid the risk of cracking through vibration.

The remainder of construction is very straightforward with the setting-up instructions proving to be easy to understand as well as accurate. (Which is more than I can say for this article.)

An area that needs drawing attention to is the overtight gear mesh between the final gear and the pinion on the intermediate shaft. This cannot be altered by the builder as the bearings between the two shafts are of fixed centre distance so I removed the main blades and ran the engine at one third throttle to help bed in the gear train. This eased off the mesh slightly and so it was off to the flying field.

I know that every reviewer says this but the Magic really did fly straight away (!) with only minor adjustments to the engine needle valve. After a couple of flights with the engine set very rich to run it in, the needle valve was turned in until there was just a hint of four stroking. It was now time to explore the climb rate. I found it to be somewhat rapid compared to Schluter's I have owned before. There is a choice in the kit for thin solid or thick hollow paddles. I found that the latter without the flybar weights suited my style of flying and made aerobatics a pleasure. At a later date I tried a set of glass fibre reflex section blades but these did nothing for me (or the helicopter) and seemed to detract from the Magic's autorotation performance especially in calm conditions.

To sum up the Magic's abilities, I would say that in engineering terms it is strongly built and will prove to be durable; it should also make a good F.A.I. machine in the right hands. One cannot help but compare it with Kalt Baron 60's and Omegas and to be truthful it does not possess the same refinement and precision. However, considering its comparable fine qualities and lower price point it does represent good value for money. □

The new plastic radio mounts make building a Schluter kit much easier now. Red anodising makes a pleasant change from the usual black.