SCHLÜTER CHAMPION — AN OVERVIEW

John Bottomley's personal touch on Schlüter's Champion.

Those of you who fought your way through my screed on the Baron 20/28 will be pleased (?) to note that I'm at it again, but this time the Schlüter 'Champion' is in the spotlight. What do you do when you're quite happily flying miscellaneous Japanese/American machinery such as the 'Baron 28', 'Competitor', 'GMP Hughes 300' and the 'Shuttle' and you get a 'Champion' kit for Xmas? Well, in my case I gratefully accepted and rushed off to acquire another OS motor of the appropriate size to put in it.

I also did a little research into what other famous scribes had written about the beast — after all there was no point in reinventing the wheel. With a competition pedigree second to none, I knew it would fly superbly; but I just wanted to incorporate any modifications or updates which would make it that little bit more reliable, etc. I have listed some references at the end of this article. The following notes are therefore a distillation of what others have done, plus some of my own ideas. The final product is a machine that I'm still getting to grips with and will carry me on up the learning curve. For the sake of convenience I have split the comments up into a number of sections, namely; r/c equipment installation, tail drive/boom, engine/drive train, fuel tank, rotor head and 'Superior' canopy conversion.

One of the difficulties associated with building a kit that is different to the others in one's experience is that of being objective about those differences. Such was the case here, after having built and operated a number of Japanese designs, this was to be my first in-depth exposure to Schlüter's design and construction philosophy. I must confess that I found the instructions to be lacking compared with those offered by GMP and MAS; however the magnificent isometric drawings were a salvation.

R/C Equipment Installation

This is first on the agenda because it took me so long to make all the necessary servo cut-outs. It was part way through this exercise that I realized why at least one reviewer had had to raise the whole woodwork assembly to optimise the control runs. The Schlüter instructions/drawings presuppose the use of West German r/c equipment. A comparison of servo styles shows that the position of the mounting lugs is considerably different. This means that the height of the output disc above the servo mounting plate can vary also. The optimum solution is to make a mock up of the woodwork out of cardboard and experiment until the best position is found. It will be necessary to move the servos fore & aft and up & down to achieve this optimum position. A similar ploy should be used to determine exactly where the pushrod clearance holes go in the canopy mounting plate. Final comment on the r/c installation is in regard to the fore & aft cyclic linkage. Since the swashplate design used on the 'Champion' does not feature 'in-line' input/output connections, differential should be incorporated at the servo output disc.

Tail Boom/Tail Drive

There are a number of standards of tail booms in use. The original had 4 plastic bushes and 4 associated lubrication holes. The latest version has 7 plastic bushes and 7 lubrication holes. My kit had 7 plastic bushes, but only 4 lubrication holes — so beware! It would appear that there have been tail drive wire 'whirling' problems and the extra plastic bushes are an attempt to cure this. I opted for a conversion to brass tube and a well greased drive wire. The basic procedure is as follows; firstly drift out the plastic bushings using a length of 3/8 inch dowel. Drill the centre hole of the plastic bushings out to 1/8 inch, preferably using a drill press to ensure that the enlarged hole is parallel to the o/d of the bush. Now refit the bushings, locating them close to the lubrication holes in the tail boom (note only refit the same number of bushings as there are lubrication holes). Now insert a 1/8 inch o/d piece of brass tube, 24 inches in length, through the plastic bushings, locating it 2 inches from the side frame end of the boom. Drip some thin cyano glue through the lubrication holes, onto the brass tube. This will 'wick' its way under the plastic bush, thus securing it. To make sure, spray a little accelerator into the boom through the lubrication holes. When installing the boom, it should be fitted with the holes underneath; however it will be necessary to redrill the tailplane mounting holes. The final step is to grease the taildrive wire with grease supplied in the kit.

There are several other minor areas that need a little extra attention to ensure a smooth running and reliable tail boom assembly. When tightening the drive shaft coupler (Part No. #3300) onto the drive gear shaft (Part No. #3306), ensure that the set screws are tightened evenly to minimise the run-out of the coupler. Any run-out here will excite tail drive wire whirling. I also noticed that the tail drive plastic bearing holders (Part No. 385) are apparently not symmetrical — install them whichever way gives the best meshing of the tail rotor drive gear with the main gear. Also in that area beware of collar #261 touching the top of the main drive gear. The tail boom has been known to move rearwards despite the clamps and bolts being secure. Not only will this affect the tail rotor drive with interesting results! Fortunately there is a simple, but effective cure; fit 2 small self tapping screws through the side frames, between the clamps and into the boom.

My final comments on this area relate to the tail rotor pitch change wire — I know a one piece wire would have been longer than the box — but equally I'm not sure a joiner part way down is the answer. Since I'd already completed that section of the machine, I bound and soldered a wire bridging piece either side of the coupler. A neater solution would be to use a brass joiner tube and solder — please ensure that the brass tube extends beyond the threaded sections of the wire, otherwise fracture will occur where the threads stop. Finally I also used a ball link in place of the specified quick link, because there have been cases reported in the model press of these quick links failing in the 'throat' area.

Engine/Drive Train

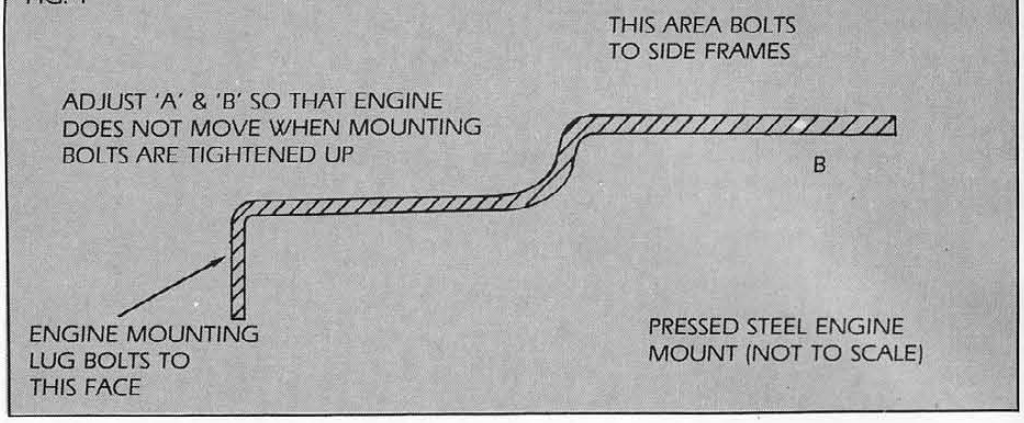
Interestingly I had no problems here aligning the clutch/starter shaft assembly, however when I came to fit the engine to the

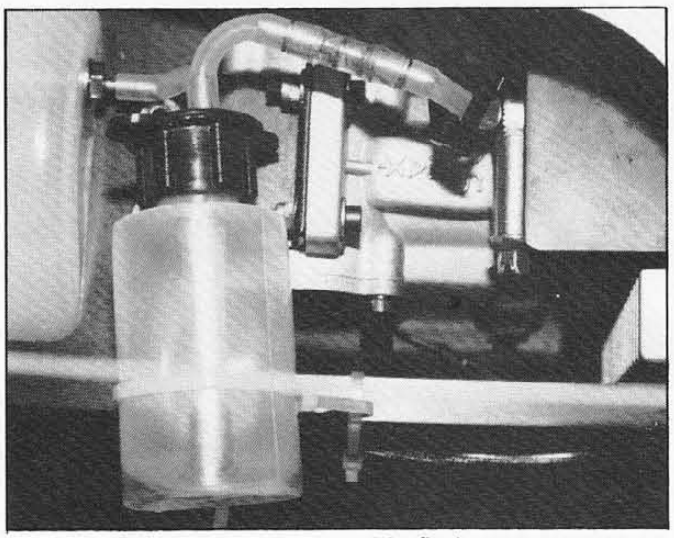
sideframes using the pressed steel engine mounts, I ran into difficulties. The crux of the problem centred around the engine mounting brackets, which being pressings were not a perfect section (see fig. 1). Hence much tweaking and adjustment was required before the engine would stay in alignment as the bolts were tightened — even then the lightweight sideframes were very flexible at this stage in the assembly sequence. The real answer of course is a machined aluminium engine mount and I gather from talking to the UK importer, Jack Williams (tel: (0482) 882311), that the latest kits come with a revised motor mount, which is also available separately. The revised mount consists of a spacer which fits between the sideframes and 2 pillars onto which the engine is bolted. Talking of Champion updates, there is now a machined aluminium clamp available for clamping the boom steady to the tail boom — this replaces the worm drive clip previously used. 'Robbe Model Sport', the US subsidiary of 'Robbe GMBH' which now own Schluter, have produced a similar clamp, but this incorporates a tail plane mount as well.

Moving onto the cooling fan shroud, I ran into problems trying to fit the vacuum formed extension over the heat sink head on the OS61H. Fortunately the vacuum formed moulding contains two cooling shroud extensions and it is possible to make one wider shroud from the two narrow ones (see fig. 2). The modified extension is now considerably wider than the rest of the shroud assembly; so I used some heavy duty, self adhesive, foam rubber draught excluder material to seal the gap.

Schlüter designs have long been known for their forward facing engine cylinder heads, which can make glowplug access and energizing a problem. Obviously a remote glowplug connector is a worthwhile accessory and I have had good success with a McDaniel r/c glow plug adaptor model #143. I'm not sure if these are imported into the UK or not, but in any event fig. 3 shows the principle involved. The hex nut, which is the same size as a glow plug, is pressed onto the larger diameter section of the jack plug. The combination simulates a glow plug enabling standard glow-clips to be used. This dummy glow plug can be mounted anywhere convenient on the airframe.

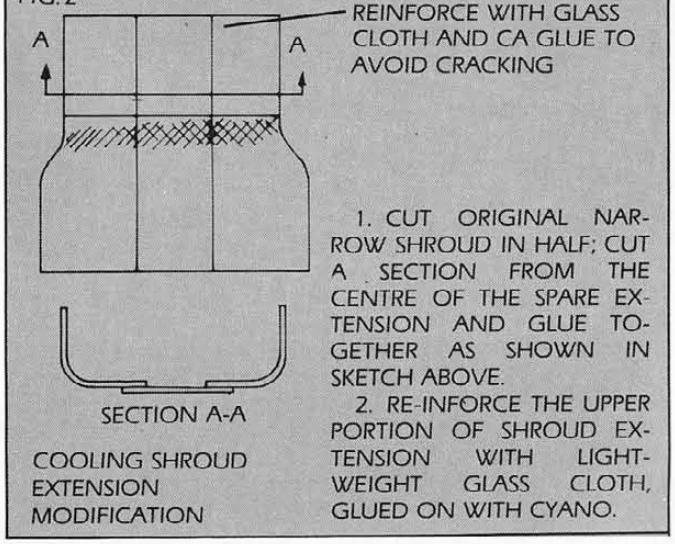
FIG. 1





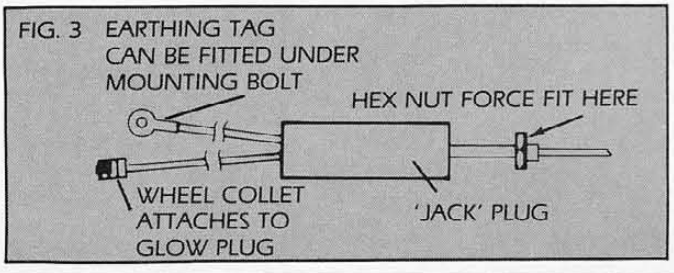
My final two comments on this part of the machine are fairly obvious, but nevertheless worthy of comment. Firstly use the 8 bolts which attach the autorotation unit to the main gear to eliminate any slight run-out that may be present in the main gear. Secondly, check the main shaft for straightness, since the slot cutting procedure can induce bending manufacture. Some new shafts have been measured at 0.015 inch out of true!!

FIG. 2



COOLING SHROUD EXTENSION MODIFICATION

FIG. 3



Fuel Tank

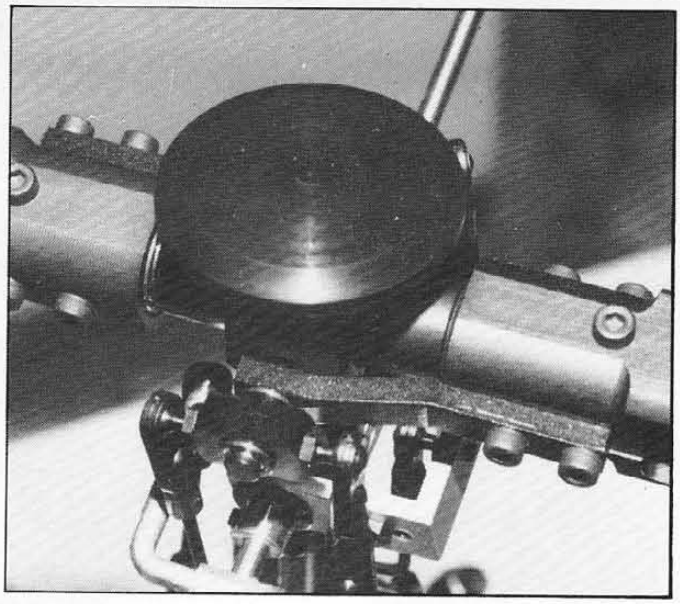
The prominent fuel tank and its location have been a Schlüter trade mark for many years, but once again a little attention to detail can make life easier. The fillers/vents should be located as near the top of the tank as possible otherwise the capacity of the tank is reduced. Secondly, they should be located aft of the tank mount/frame, otherwise the tank cannot easily be removed. The fittings are pressed together and are somewhat prone to cracking. Now style-machined brass fittings are becoming available, but an interim 'fix' on the old style fittings is to solder them together. The silicone tubing supplied in my kit was very thin walled and knowing that silicone tubing is prone to splitting, especially where it is attached to fittings, I substituted a thick walled variety. I did experience some difficulty in getting a consistent engine run — a full tank produced a rich needle valve setting and an almost empty tank produced a lean engine run. I solved this by putting a 1 oz 'MFA' tank in the fuel system to act as an auxilliary tank (see photo and figures 4 and 5). In case my bright idea didn't work I decided not to drill holes in the side frames! In the end I came up with a mounting using a section of a rubber eraser and two nylon tie wraps. The bonus of it all was that it became an antivibration mounting as well.

Rotor Head

I used the balancing system detailed in issue 1 of Model Helicopter World; but I did also compensate for the rather heavy swash plate driver. Several previous reviewers did discuss the size of the original rather long paddles, as indeed does the instruction leaflet. I elected to cut them down by 30 mm, which makes them the same size as the GMP 'Competitor'. I am very happy with the response, but obviously this is a very subjective thing and perhaps one should start off with standard size paddles and experiment.

Do not forget to use threadlock on *all* ball links on the head area.

Initial ground runs and adjustments revealed a problem with stopping the rotor head using the palm of the hand — it was quite painful. I devised a head button to alleviate the problem (see photo), these are available in aluminium or nylon from Helimprovements (details at the end of the article).



Canopy

I happen to think that the Schlüter 'Superior' canopy is one of the better looking ones available, so I decided to fit one on the champion. The 'Superior' canopy is considerably longer, particularly towards the rear, so it is advisable to fit the rear canopy mounts used on the Superior. The parts required are available from Jack Williams and are as follows:

SU/08; Cabin screws (SX81 & Sup); Qty 2,

SU/69; Hx Head screws M3 x 10; Qty 2,

SU/76; Threaded pin M4 x 20; Qty 2,

SU/1238; Bush-canopy; Qty 2.

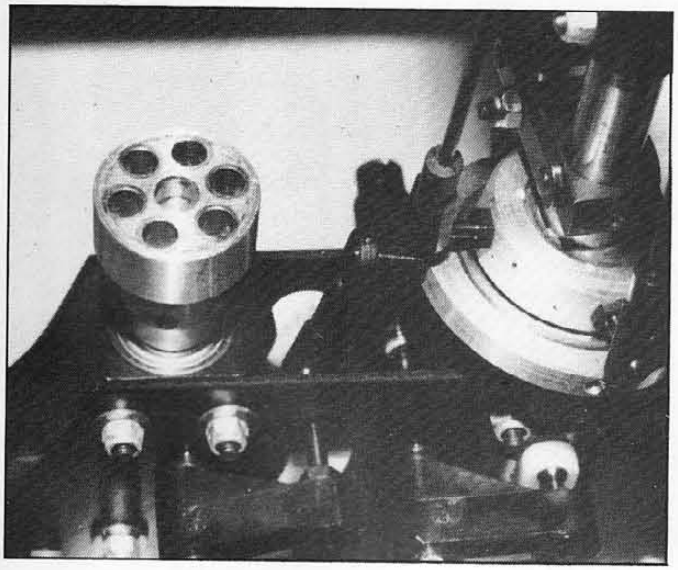
The photo of the completed machine shows off the graceful lines to perfection (disregard the clown flying it!).

Having fitted such a beautiful canopy I didn't want to risk damaging it when the conventional cone start system slipped or flew off (bitter experience here!), so I fitted a Helimprovements 'no-load' starting system (see photos). The cone on the clutch shaft is replaced by a 'pepper-pot' adaptor which is also held on by set screws. The starter extension plugs directly into the starter cup after only slight modification to the cup. Extensions are available for all popular starters.

Further reference material on the Schlüter Champion:

1. 'RC Modeller' magazine, Feb '86, Pp 70,72,76,77,80 and 81.

2. R/C Helicopter' magazine, late summer '87, Pp 40;-44.



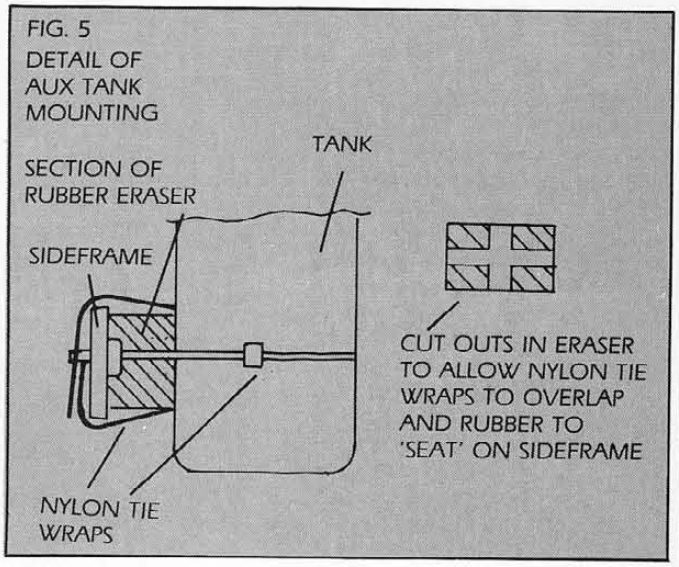


FIG. 5
DETAIL OF AUX TANK MOUNTING

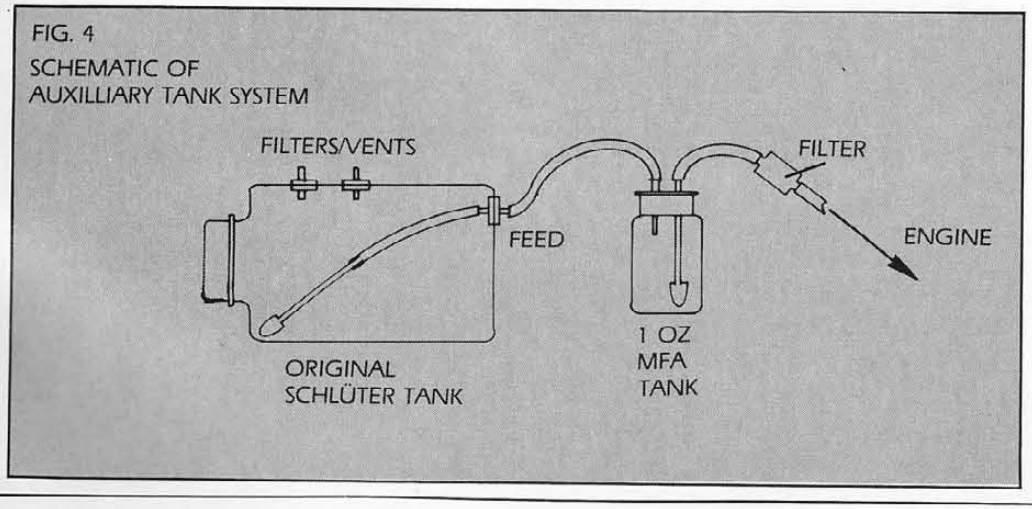


FIG. 4
SCHEMATIC OF AUXILLIARY TANK SYSTEM

Suppliers mentioned in article:

1. Jack Williams Ltd,. Eastwood, Beverley Road, Walkington, North Humberside. HU17 8RP. Tel: (0482) 882311 — Importer of Robbe/Schlüter helicopters.

2. McDaniel R/C inc., 12206 Guinevere Road, Glenn Dale. MD20769. Tel: (301-464) 2260 — Glow plug remote connectors, etc.

3. Helimprovements, c/o 5 New Walk, Shillington, Hitchin, Herts. SG5 3LN. Tel: (0462) 711893 — Head Button No load starting system.