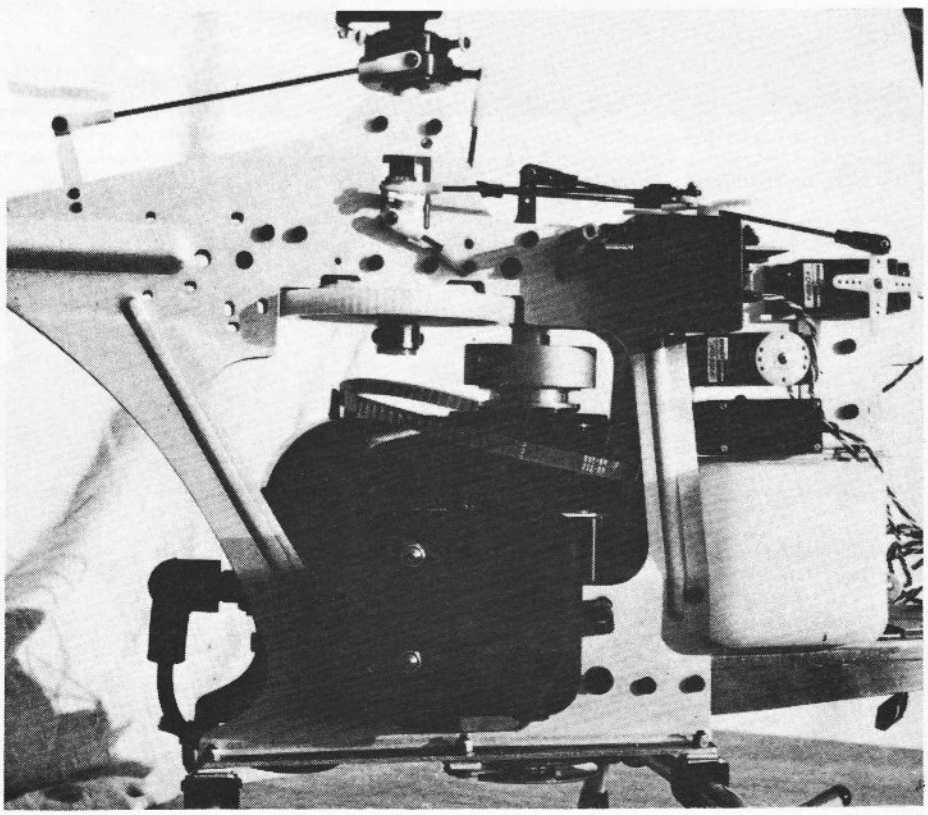
HELI-PAD

by John Heaton



KALT'S PETROL ENGINED *Baron* is quite new on the market and consists of basically an ordinary *Baron 50* with a re-designed frame to take a petrol engine. The canopy, boom, head, blades and tail gearbox is the same, but undercarriage, side frames, clutch and transmission along with the motor are different. The undercarriage is now a tubular affair, like the latest Hirobo scale jobs and together with the engine really gives the *GS22* a functional air.

Interestingly the model is the only one from the current crop of petrol jobs that scrapes in under the five kilos, weighing a whisper under 11lb. The engine is incredibly light for a magneto equipped petrol motor and didn't feel a lot heavier than a normal 60. Part of the reason is lack of a recoil start and not having an integral 'full size' type cooling system and clutch. The crankshaft ends rather like a normal model engine with nut and thread onto which attaches a model helicopter clutch and cooling fan, obviously three components being lighter than would normally be fitted to a small industrial engine. For starting you are provided with a normal pulley and belt for electric starting and on the bottom of the motor a slotted pulley for pull starting like a **Seagull** outboard motor.

The transmission ratio through the familiar nylon cog layout is six to one, exactly the same as the KKK *Hughes 300* incidentally, compared with about ten to one for glow jobs, and the clutch is quite a nice unit with throw out shoes, retained by an O ring and you are provided with various sizes of ring so you can tailor the engagement rpm to your desired choice. In this case the second slackest ring proved perfect, i.e. complete disengagement at slow idle and powerful take up when opened up. For this test I am using a customer as a guinea pig in the form of Rob Abbott who started flying last year with a second-hand ready-to-fly *Falcon Mark I.* He made steady progress through the year and is now flying very nicely without so much as breaking a blade. Rob and I studied the components together before he took the kit away to build, he came back a week later with the model proclaiming no problems. His Futaba L series fitted easily due to the isolated servo plates provided.

And so to the acid test. The engine fired easily on the electric starter, it seemed quite strange not having a glow lead to remove and sounded very sweet, with effective silencer and very few rattles from the internals. Tick-

Rob Abbott with the completed *Baron* — and (left) the mechanics before the pod is fitted.

over was good but the main jet was a bit rough, half a turn on the adjust screw and she sounded perfect and we ran her up for a lift off. First lift off was very lurchy, the machine being far too sensitive on cyclic. I had advised Rob to give the swash plate plenty of movement because "*Barons* are very docile," yet here was the petrol *Baron* with an identical head blade and paddles with more sensitivity than I have ever experienced in a Kalt before.

We took her inside and shifted the control links to the inner holes on the cyclic servos roughly halving the swashplate movement. This was eased by the proper connections at each pushrod end that I had advised Rob to fit, rather than the Mickey Mouse joggles or Z bends shown on the plan, my only criticism of an otherwise superbly engineered kit. Much better this time, although still not as sweet on cyclic response as *Barons* usually are, however, we soon found the optimum rpm by adjusting the pushrods to the blades and altering pitch angle and she was flying very well. It seems the *GS22* is much more critical of optimum rpm settings than the glow powered counterpart. RPM too low and control is sloppy, rpm too high and machine is twitchy, normally you have a large range to play with but with the *GS* this range seemed much narrower. It was truly amazing how unmanageable it was at both ends of the rpm range compared with the smooth docile and manageable handling with rpm at optimum. Anyway after initial adjustment performance was very pleasing, engine smooth quite and powerful, cyclic nice albeit a bit vague compared with the mixed Bell/Hiller systems. Not a criticism you understand, it's swings and roundabouts, a mixed system is more complicated but has instant response, a pure Hiller system is simpler and has slight delay in reaction.

Tail control is superb, those high lift plastic blades again. I can't tell you about circuits as we felt it prudent to give the engine a good bit of time to run it in before high flights, and I look forward to putting the machine through its paces in due course.

Three Bladed *Gazelle*

Readers may have seen photo's of John Barrow's three bladed *Baron* and magnificent super scale *Gazelle* recently. The other day John brought his logical conclusion in

The *GS22* is nice and steady in flight with reduced swash plate movements.

and said have a go. He had fitted the three bladed rotor to his *Gazelle* and it looked an absolute dream, super long thin weighted blades which drooped when stationary. John had made the blades by splicing together sections of Morley blades to get the length, machined slots for lead weights in tips and covered the whole caboodle in glass fibre. The head is made from the latest Morley components utilising the flexible beam principle and the whole thing looks and is delightfully simple. Fortunately John is one of the growing band of helicopter enthusiasts who operate his model in my preferred mode, i.e. collective towards you for pitch up, and whilst I have learned to control models in the fixed wing throttle mode, I would not have risked flying such a masterpiece on an alien mode.

The model lifted off smoothly and quietly without a tremour of vibration, and was rock steady in the hover. It was as easy to fly as any trainer. I didn't need a second invitation to move off into translational flight. It gracefully climbed away with unbelievable realism with absolutely no nasties or surprises. I did circuits with approaches to landings for about ten minutes and was enthralled. If anything I felt cyclic was almost too docile, but no pitch up tendencies with speed. An interesting handling feature I have noticed with three bladed rotors, compared to flybar-ed two bladers, is the cyclic trim difference power on and power off. In flight you compensate for the pull of the tail rotor with cyclic, (or apply cyclic trim). When you make an approach, you back off collective and linked throttle hence reducing torque, then you lose the tail rotor lateral pull by applying left rudder to maintain heading and if you had trimmed cyclic right you have to apply left cyclic to stop a lateral drift and bank to the right. This trim change with power is very noticeable with John's *Gazelle* and is something I feel is inherent with three blades. I noticed the same thing with my petrol *Lama* and the full size *Enstrom* that I fly.

Back to the model, a very creditable effort indeed. I thank John for allowing me to handle what I would describe as the best model helicopter in the world at the present time.

Finally

I have had several people suggest that I run a training cum holiday week, during August, and I reckon it might be a lot of fun. We have got caravan and camping facilities, water, toilets, unlimited flying space and the workshop. So if you are interested contact me on Weyhill 3333 and I will arrange it.

That neat little petrol engine, note slotted rear pulley. Right, rear view of the mechanics prior to fitting the boom.