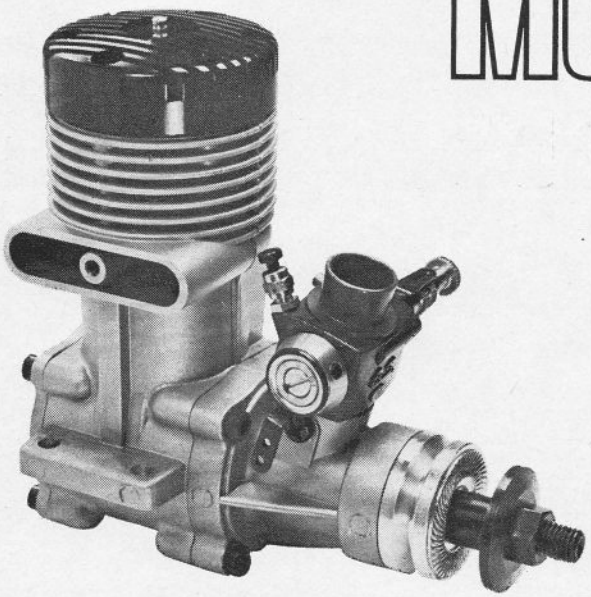
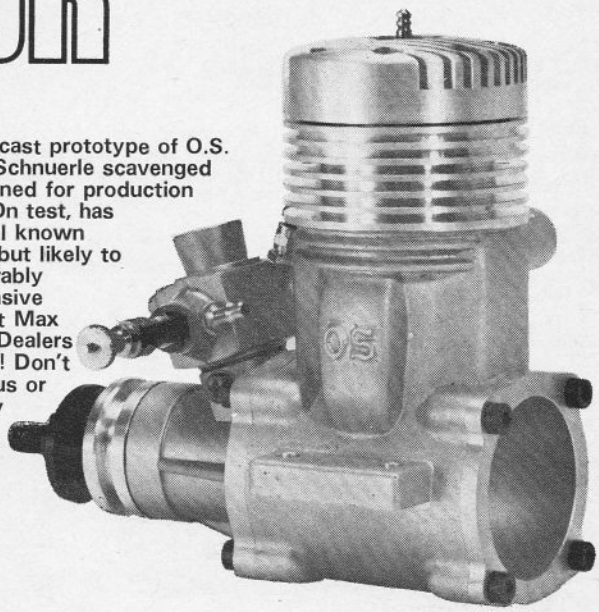
Peter Chinn's

RADIO commentary MOTOR



Above: new 'Black-Head' GR series O.S. MAX H60F engine, now beginning to reach KeilKraft dealers, is a further refined and more powerful development of well-known 'Gold-Head' model.



Right: Sandcast prototype of O.S. Max 60SR Schnuerle scavenged motor destined for production next year. On test, has outpaced all known opposition but likely to be considerably more expensive than current Max H60F GR. (Dealers please note! Don't embarrass us or KeilKraft by ordering this engine. It is NOT yet available.)

New O.S. 60 'Black-Head'

Production of this motor, officially designated O.S. Max-H60F 'GR' Series, began four months ago and the U.K. importers are now distributing their first consignment to retailers. The GR is the fifth in the Max H60 series, which began with the H60 rear drum-valve motor in 1966, followed, shortly afterwards, by the front rotary-valve H60F and, later, by the more powerful H60 GP and H60F GP models.

The H60F GR is identified by a black anodised head. It uses the same castings as the gold head H60F GP but has a new crankshaft, piston, conrod, gudgeon-pin and cylinder liner, plus the latest Type 74 O.S. carburettor. The object of these modifications is to further raise the H60F's performance, while maintaining or increasing its durability.

Judging by various prop r.p.m. figures given us by the O.S. Experimental Department, we would estimate the gross power output of the new H60F GR to be around 1.4 b.h.p. on standard fuel, compared with 1.25 b.h.p. for the H60F GP and 1.00 b.h.p. for the original 1966 model. Certainly the engine must be one of the most powerful crossflow scavenged R/C 60's produced to date but, for those who want the ultimate in power – and, particularly, more power on big props as well as a high peak b.h.p. – O.S. will be offering their entirely new Max 60SR Schnuerle scavenged motor some time next year. This, however, is likely to be a good deal more expensive than the H60F GR and it is expected that the 60SR will therefore supplement, rather than replace, the GR. (Incidentally, whenever we publish news of an interesting new prototype, it seems that some readers rush off to buy one. The result is that dealers try to order and we then get complaints from distributors about being pestered for non-existent products. So! Please wait until the production model is announced!)

To get back to the H60F GR, the modifications primarily responsible for its improved power output are an increase in exhaust port area (individual ports are slightly smaller but are increased in number from four to six) and a larger carburettor choke area. The Type 74 carburettor is of the automatic fuel metering type and has a choke bore of 8.8 mm. which, after allowing for the jet tube and fuel-metering sleeve, gives an effective choke area of about 38 sq. mm. With this, the use of a mildly pressurised fuel supply is advised and this is provided for by the screw-in pressure nipple supplied with the OS-704 silencer included with the engine. However, for the benefit of users who prefer unassisted suction feed, a special choke restrictor is included and when this is fitted to the carb, effective choke area is reduced to about 29 sq. mm.

Basically, the Type 74 carburettor is last year's Type 73 with an enlarged choke, plus provision for reducing choke area for suction feed as already stated. It uses the same body except that this now has a dark grey anodised finish. Another refinement is an improved idle stop screw with a gland nut, rather than a spring, to ensure more positive setting. The Type 73 automatic fuel metering system is retained, with easy idle mixture control via a screwdriver slot in the mixture control valve so that this can be adjusted for the best possible setting while the engine is actually idling.

Structural changes include a new piston with the gudgeon-pin located by circlips instead of by aluminium end-pads, a revised connecting-rod and a hard-chromed cylinder bore. The crankshaft has a thicker web, and has been rebalanced by means of a larger crescent counterweight.

The H60F GR is fractionally heavier than the H60F GP but its weight is still very reasonable at 14.7 oz., or 17.6 oz. complete with OS-704 silencer.

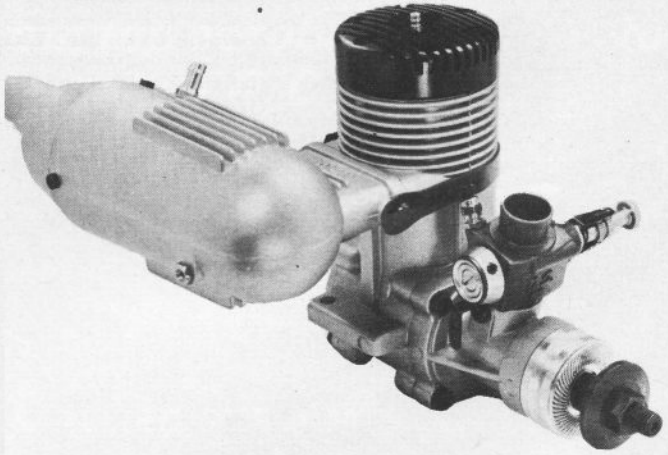
New Enya 40 TV

The expected entry of the Enya brothers into the increasingly popular .40 cu. in. market has been confirmed with the release from their Tokyo factory of the Enya 40 Model 6002. As with other Enya engines, this is offered with a choice of standard intake and spraybar assembly (for control-line and free-flight use) or with an Enya TV (throttle-valve) carburettor for R/C use.

The engine is of typical Enya design and appearance, being of the crossflow or open loop scavenged type with a detachable front

O.S. Max-H 60F GR

Some photographs showing the main differences between the O.S. 'GR' Series and the previous 'GP' Gold-Head model were published in the September 'Commentary'. The GR's modifications are rather more extensive than those made to the Webra. As on the Webra, however, the shaft has been re-balanced with a heavier counterweight and carburettor choke size increased. The effective area of the latter is now approximately 38 sq. mm. and a silencer pressurised fuel system, using the nipple supplied with the OS-704 silencer is advised. However, for the benefit of those users who prefer to run on normal suction feed, a thin brass choke insert is also included which can be fitted after partially dismantling the carburettor.



Performance tests of new O.S. Max-H. 60F GP ("Blackhead") show useful increase in power over previous Gold-Head model, with much improved torque.

In addition to a new crankshaft and carburettor, the 60F GR has a new cylinder, piston, conrod and gudgeon-pin and a modified main casting and backplate. Port areas and timing, including rotary-valve timing, have also been changed. Instead of being case-hardened, the cylinder liner has a hard-chromed bore with six, rather than four, exhaust ports. Actual individual ports are slightly smaller and although the GR has a larger exhaust area than the GP, transfer port area is slightly smaller.

The piston material has been changed and substantially longer piston bosses are used. The conrod, bronze bushed at both ends, now has a slightly smaller big end to suit the new crankshaft which has a 6.5 mm., in place of 7.3 mm., dia. crankpin. The gudgeon-pin, formerly located by end pads, is now retained by circlips – exactly the opposite change to that made with the Webra. Again, unlike the Webra, the induction period has been reduced instead of extended. It now closes at 50° A.T.D.C., for a total induction period of 195° of crank angle.

The overall effect of these various modifications has been to raise power output but, more especially, to increase torque under heavier loads, resulting in improved performance on the larger sized props.

The maker's silencer is still the OS-704 type, a conventional expansion chamber with an outlet i.d. of 8 mm. With an outlet area of only 50 sq. mm., this would be expected to knock quite a bit off the engine's peak power output, but it is one of the most effective of current 60 size silencers as regards noise suppression.

For our tests we first ran the 60 GR with the silencer and on pressure. Then, in order to check how much power loss the stock OS-704 silencer caused, we ran a duplicate series of tests with the silencer removed. This meant that the carburettor had to work on suction feed but it did so quite willingly without our having to resort to the choke insert. Running both with and without the stock silencer enables one to estimate how much performance would be available by opting for a compromise, i.e. less restrictive outlet area, such as by using a proprietary low-loss silencer, or by opening up the OS-704 tailpipe to, say, 10 mm. dia., giving a 78 sq. mm. outlet, *where conditions permit*.

Using 5 percent nitro and an O.S. No. 9 glowplug we obtained a maximum power output of 1.35 b.h.p. at 15,000 r.p.m. less silencer and just over 1.10 b.h.p. at 13,500 r.p.m. with silencer. In other words, the OS-704 silencer reduced peak power output by 18.5 percent. A check on prop revolutions, using the same fuel, gave the following:

Prop Size & Type	With Silencer (50 sq. mm. outlet) r.p.m.	Less Silencer r.p.m.
12 × 6 Top Flite maple	11,000	11,400
11 × 8 Top Flite maple	10,800	11,300
11 × 7½ Power Prop maple	12,000	12,500
11 × 7 Top Flite maple	11,600	12,100
11 × 6 Top Flite maple	12,500	13,200
11 × 6 Power Prop maple	13,000	13,800
10 × 6 Top Flite maple	14,200	15,100

Comparing these figures with those given for the Webra under similar test conditions, it will be seen that there was not a great deal to choose between the two engines as regards ultimate performance, the main difference being that the O.S. seemed to be slightly less affected by a restrictive silencer that the Webra. Like the Webra, the O.S. handled nicely with very easy starting, smooth running and an excellent throttle control. Both, in fact, serve to emphasize how very good is the modern 10 c.c. R/C engine.