

on top of the body and an adjustable throttle arm. The throttle choke is 4mm i.d. and, unobstructed by needle or jet, has an effective area of 12.6sq.mm.

Available for use with the Master-4 is a special Cipolla silencer. As the photo shows, this is quite large (actually it is just over 6in. long) and should cause a minimum of power loss with reasonably good noise attenuation. It is solidly made, has a capacity of nearly 50cc and a perforated outlet tube (sixteen 3mm holes = 113sq.in.) through which gases escape to a tailpipe of 7mm i.d. and 38.5 sq.mm. area.

The Master-4 is slightly larger and heavier than its contemporaries. Checked bare engine weight of the example examined was 245 grammes (8.64oz.) to which is added 74g (2.61oz.) for the silencer, making 319g (11.25oz.) in all. The Master-4 is claimed to develop 0.60 bhp at 15,000 rpm and it is hoped to check this out in due course.

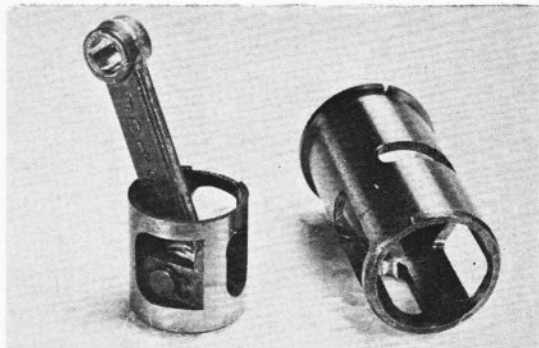
We are indebted to Roy Scott of Micro-Mold for the opportunity of examining this interesting new Cipolla product.

**O.S. Max 25F-SR Tested**

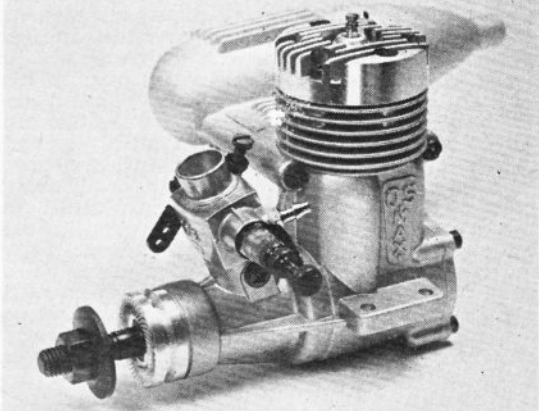
More powerful, heavier and more expensive than the crossflow scavenged, bronze bearing O.S. Max 25 R/C the Schnuerle-scavenged, twin ball-bearing Max 25F-SR was introduced nearly a year ago but we have only recently got around to testing one and this is the first published report on the engine. The results were good. Prop rpm figures obtained on 5% nitro fuel, using an O.S. No. 8 glowplug and the OS-762 silencer supplied with the motor were as follows (figures in parenthesis are the results of a repeat series of checks with the silencer removed):

10 x 6 Top Flite maple	9,800 (10,350) rpm
9 x 6 Top Flite maple	11,000 (11,800) rpm
9 x 6 Taipan glassfibre-nylon	11,500 (12,400) rpm
10 x 4 Taipan glassfibre-nylon	11,700 (12,600) rpm
9 x 4 Taipan glassfibre-nylon	13,800 (14,800) rpm
8 x 6 Power-Prop	14,200 (15,300) rpm
7 x 6 Taipan glassfibre-nylon	15,900 (17,100) pm
8 x 4 Taipan glassfibre-nylon	16,000 (17,200) rpm
7 x 4 Taipan glassfibre-nylon	18,500 (20,400) rpm

The 25F-SR's strong point, compared with other engines in the newly emerging 3.5-4cc high-performance motor group, is not its peak output (in this respect it falls short of the OPS 3.5-Speed as well as the immensely powerful K & B 3.5) but in its high maximum torque which gives it well above average performance on the props most likely to be used, such as 10 x 4, 9 x 5, 9 x 4 and 8 x 6. If the engine's maximum available



Cipolla cylinder and piston assembly. Unorthodox porting provides Schnuerle type gas flow. Left: sturdy one-piece casting, bowl-and-squish-band head, and barrel-throttle carb with automatic fuel-metering.

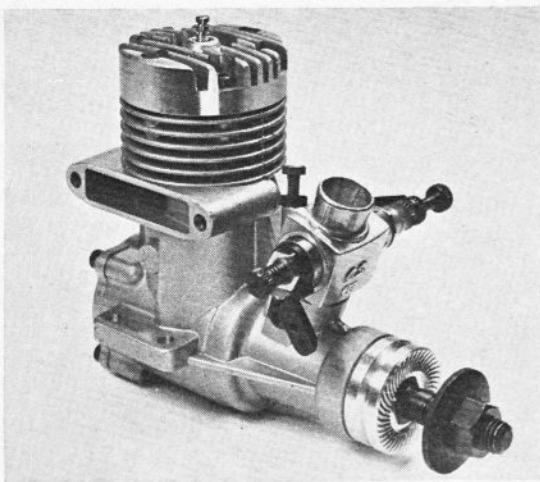


Included with each O.S. Max 25F-SR is the effective OS-762 silencer, specially designed for this engine. Below: Some Max 25F-SR parts, showing bowl-and-squish cylinder head, large diameter shaft, lightweight Meehanite piston, machined conrod and Schnuerle ported liner.



power is to be utilized, one would suggest propping it for a ground rpm of about 14,000 when the OS-762 silencer is fitted. (Peak bhp is reached at approximately 15,500 rpm with the silencer. This rises to 18,000 rpm with the silencer removed, compared with 21,000-22,000 for the K & B and OPS).

When the O.S. design team were developing the 25F-SR, a major consideration was the need for a motor capable of instant, reliable throttle response for helicopter use. That the engine is eminently suitable for small helicopters has been borne out in practice and the new O.S. Type 2B automatic mixture control carburetor



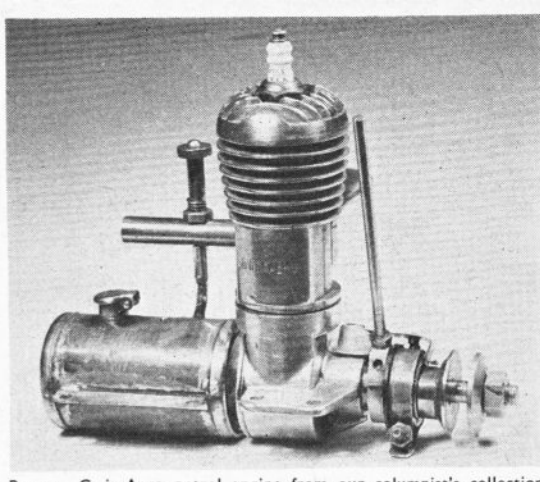
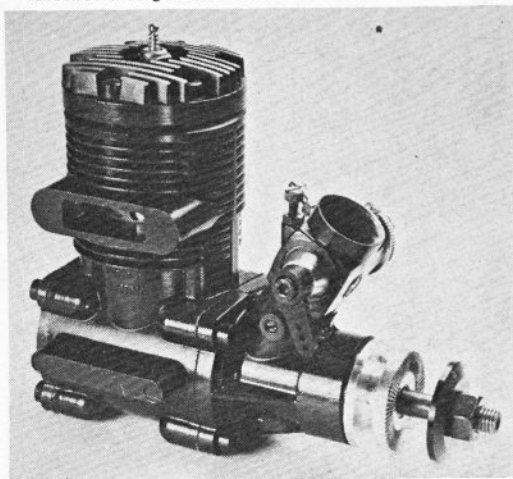
fitted to the 25F-SR works admirably. With the engine loaded for a 12,000 rpm maximum, our example provided a very linear throttle response with reliable idling down to as low as 2,200 rpm. The change from two-stroking to "four-stroke" firing occurred at between 6,500 and 7,000 rpm but was very gradual so that there was no sudden drop in power at the transition. The engine's overall handling characteristics were, in fact, very good.

Comparing the design and construction of the Max 25F-SR with the less expensive Max 25 R/C, one finds that almost the only thing that they have in common is their 18 mm x 16 mm bore and stroke. In addition to being supported in two large ball bearings instead of a bronze bush, the shaft has a bigger main journal (12 mm o.d. instead of 10.5 mm) and a larger gas passage (8.4 mm instead of 7.6 mm). The Schnuerle porting system is similar to that used for the larger "SR" series O.S. engines except that the ports are, in effect, rotated 35 deg in a clockwise direction (looking down the bore) so that the exhaust is brought to the right rear quarter and the three transfer ports are re-located accordingly.

Unlike the bigger O.S. Schnuerle engines, all of which have ringed aluminium pistons, the 25F-SR uses a lapped Meehanite piston and, because of the re-location of the cylinder ports (which provides an uninterrupted bore surface fore and aft) a fully-floating gudgeon-pin, fitted with PTFE pads is used. The machined high duty alloy conrod is stronger than that of the 25 R/C and is also longer (29 mm) for reduced rod angularity.

The OS-762 silencer is a conventional expansion

Hirtenberger HP 61F5 engines are now coming through with all-black anodised castings instead of the familiar tumbled finish.



Pre-war Gwin-Aero petrol engine from our columnist's collection. Left: the Max 25F-SR features Schnuerle scavenging, twin ball-bearing shaft and OS 2B carb with adjustable automatic fuel metering.

chamber type and bolts directly to the engine's wide exhaust duct. It has a capacity of 35cc and an outlet area of 28 sq.mm. It is equipped with an exhaust priming nozzle and an outlet nipple for pressurising the fuel system.

Checked weight of our sample 25F-SR was 215 grammes (7.6 oz), plus 49g (1.7 oz) for the silencer, making 264g (9.3 oz) all-up.

## READER'S QUERIES

### Castor-oil

**QUESTION.** "As a regular reader of the model magazines, I have noticed that when your engine tester, Mr. Peter Chinn, is running-in a new engine, he uses a fuel containing 25 per cent racing castor-oil. I have tried to buy glow fuel with 25 per cent castor-oil but I have been unable to find any. When Model Technics brought out their G-100L fuel I decided to buy some but have had no luck in finding a dealer who stocks G-100L. I then decided to mix my own fuel but I have been unable to find any special castor-oil. I have tried to locate Castrol M, Duckhams Racing Castor-oil or Newton R Racing Castor-oil."

"I would be grateful if you could tell me where I could obtain any of these. I visited a local model shop whose owner mixes his own fuel. He said that he uses "first-pressing castor-oil" and sells this to the public. Could you also tell me if this is safe to use in model glow engines?"

**ANSWER.** Genuine "first pressing" castor-oil is of the best quality and as it is readily available at your local model shop, we suggest that you use this.

It is odd that you cannot locate G-100L. Technics also offer pure castor-oil. You could drop them a line at Model Technics Ltd., Vanguard Way, Shoeburyness, Essex.

For Castrol, Duckham's or Newton castor-oils, try a motor-cycle specialist dealing in high performance and racing machines. Or you might be able to persuade a Castrol, Duckham's or Newton motor-oil stockist to order castor-oil through their local representative.

### Gwin-Aero petrol engine

Mr. Lyn Williams of Flint, North Wales, writes: "I have an old engine given me by my father about 15 years ago. I would be grateful for any information. The engine is a Gwin-Aero (Mighty-Midget). I am told it is American but I do not know how old it is, or anything else about it: size, etc."

**ANSWER.** The Gwin-Aero was one of the most popular American engines of the pre-war period. It was marketed by the Bunch Model Airplane Company of Los Angeles and dates back to 1936. Several models were produced during the following few years. In the

*Continued on page 41*