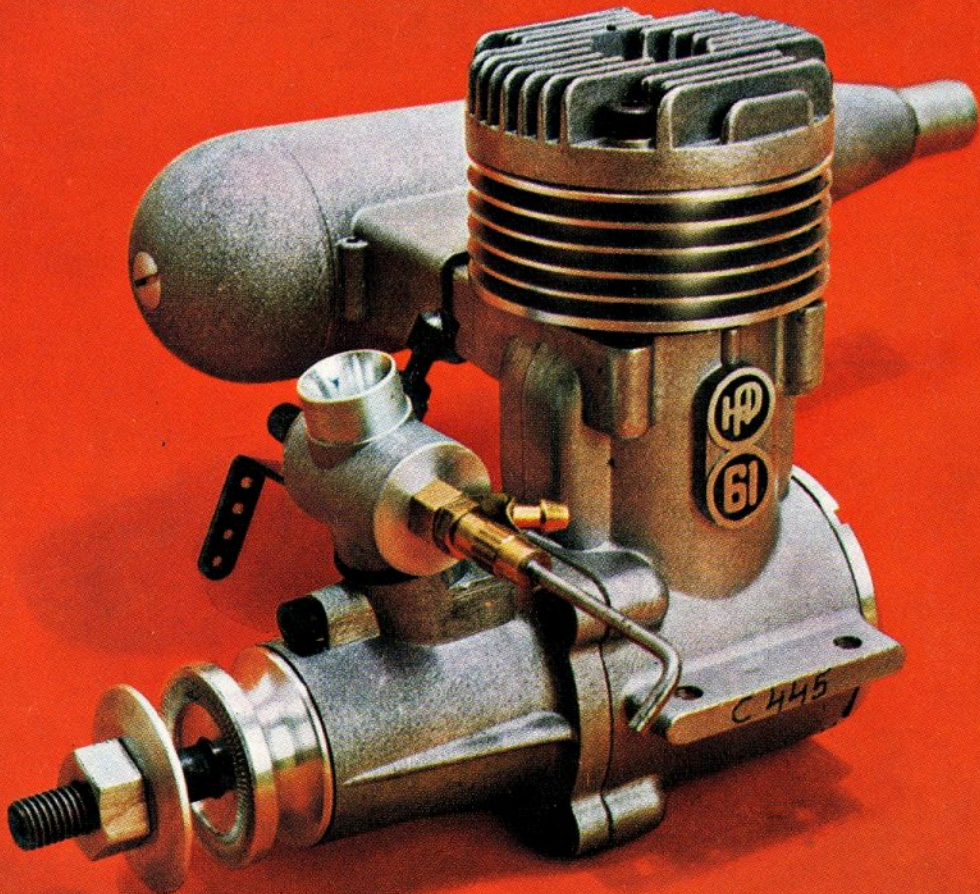


# RM

# RADIO MODELLER

THE RADIO CONTROL MAGAZINE FOR EVERYDAY ENTHUSIASTS



HP.61F FROM RIPMAX — FULL TEST THIS MONTH

APL. '71

20p



# Peter Chinn tests the HP61

*“... one of the most powerful of 10 cc engines... runs smoothly and has a good throttle”*

AS is generally known, the Austrian-made Hirtenberger HP.61 first appeared in prototype form in 1967 and went into production in 1968. It was featured in the November 1968 issue of RADIO MODELLER. Having such distinctive features as Schnuerle loop scavenging, a unique rear rotary bell-valve induction system and an unorthodox carburettor design, the HP was of considerable technical merit but did not achieve the popularity that the manufacturer had hoped for. The reasons for this were several. Firstly, although its long crankshaft and rear carburettor suggested a shape eminently suitable for certain scale type models, the engine's very considerable length meant that it would not conveniently fit most other types of models. Secondly, the carburettor intake was awkwardly placed and the throttle tricky to adjust. Thirdly, standards of construction (especially in some early production models) were not always all that one expects of what was then a quite expensive engine.

In 1969, the Hirtenberger Patronenfabrik began work on con-

verting the original design to a front induction type. The crankcase and cylinder were retained but reversed back to front, the front end of the crankcase being removed and blanked off with a screw-in backplate. A new crankshaft and main bearing housing with orthodox shaft rotary-valve were then installed in place of the original backplate induction assembly. A carburettor working on the principle of the Webra TN carb was installed and some other, minor, changes were made, including the adoption of a slightly modified cylinder head and a revised piston with single compression ring. It is with the production version of this engine, known as the HP.61F R/C, that our present report deals. Its price has been substantially reduced and, as we shall show, this new model emerges as a very good engine offering unusually good value.

## Design and construction summary

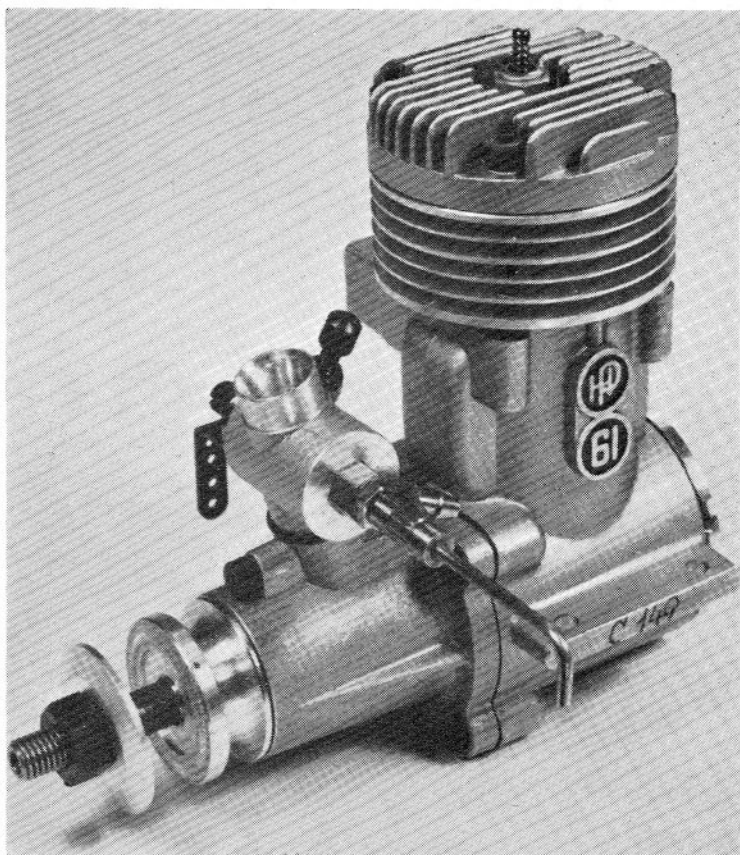
**Main Casting.** This comprises the crankcase with offset lower cylinder

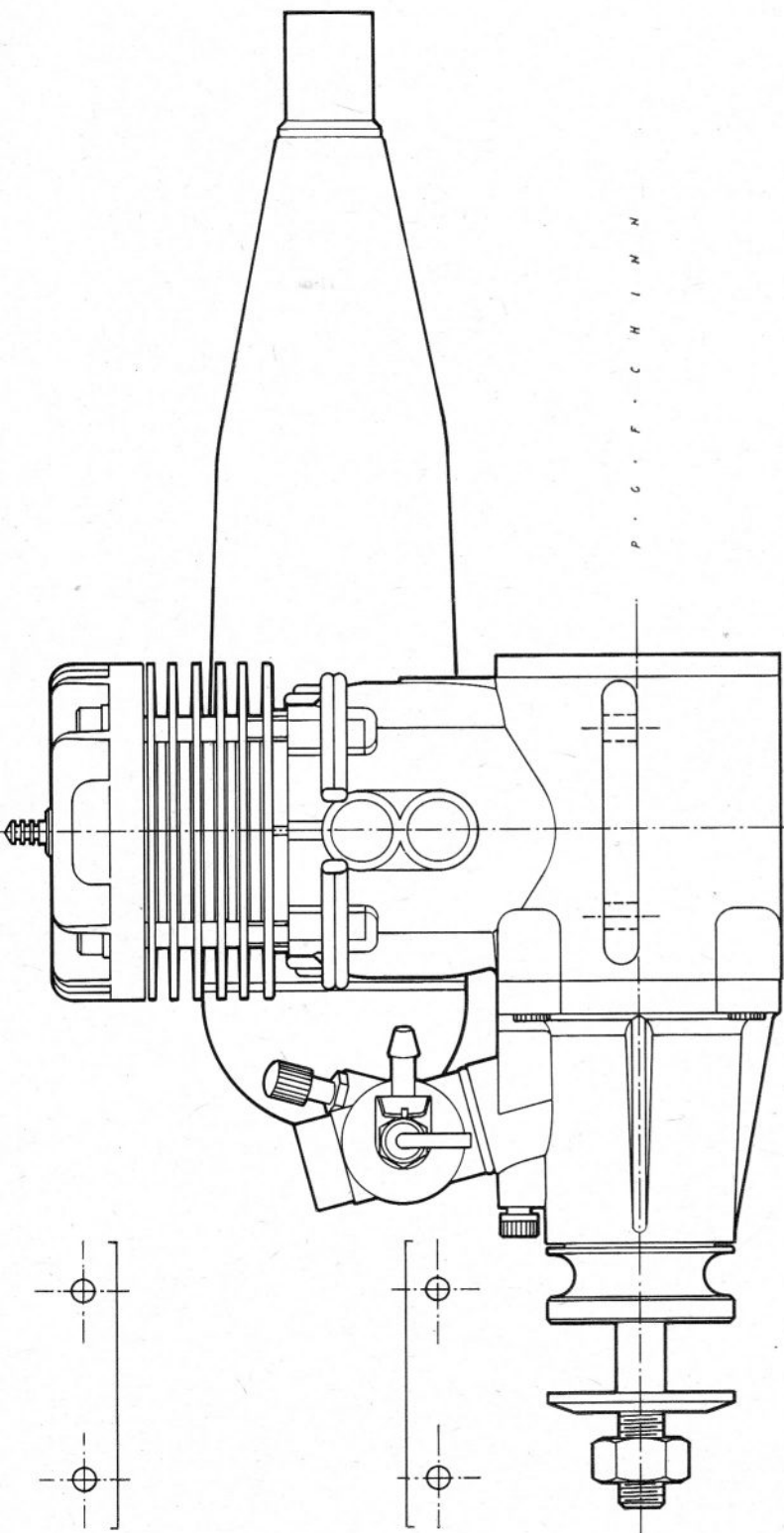
casing in pressure-diecast aluminium alloy. It includes long beam mounting lugs and an exhaust duct on the right side.

**Cylinder.** Hardened steel liner with closely fitted finned cooling jacket of machined aluminium alloy. Gasket under base flange. Three exhaust ports timed to remain open for 132 deg. of crank angle. Four transfer and one boost port, timed to remain open for 116 deg. of crank angle.

**Crankshaft and Prop Drive Assembly.** Counterbalanced hardened steel crankshaft with 15 mm. main journal, 7 mm. front journal and 7 mm. dia. crankpin. Rectangular valve port timed to remain open for 183 deg. of shaft rotation, closing at 50 deg. ATDC and admitting gas to 11 mm. bore gas passage through main journal. Machined aluminium alloy prop driver fitted to brass split taper collet on shaft.

**Piston and Connecting-rod Assembly.** Diecast and machined aluminium





alloy piston with flat deflectorless crown and single compression-ring pegged to prevent rotation. Piston skirt is cut away fore and aft to clear transfer passages and has rectangular  $8 \times 7$  mm. skirt port to feed transfer boost port opposite exhaust side. Pressure diecast aluminium alloy connecting-rod bronze bushed at both ends and with lubrication slits at both ends. Fully floating 6 mm. dia. tubular gudgeon-pin with aluminium end pads.

*Cylinder-head.* Pressure diecast and machined aluminium alloy, deeply finned with centrally located glow-plug hole. Bell shaped combustion chamber with squish-band. Two 0.2 mm. steel decompression shims between machined faces of cylinder head and cylinder jacket. Complete cylinder assembly tied to crankcase casting with four Allen cap head screws.

*Front Housing Assembly.* Pressure diecast aluminium front housing containing one 15 mm. i.d. inner and one 7 mm. i.d. outer ball journal bearings and embodying intake boss for carburettor. Fitted to crankcase with four Allen screws. Paper gasket.

*Backplate.* Deep screw-in rear crankcase cover machined from aluminium bar stock. Paper gasket.

*Carburettor.* Barrel throttle type with automatic fuel metering. Pressure diecast aluminium alloy body with spring-loaded steel throttle barrel that describes helical path in throttle housing as it is rotated. Idling mixture needle mounted in outer end of throttle barrel so that needle tip enters main jet as throttle is closed thereby reducing fuel flow. Idling mixture strength adjustable by screwing the idling

#### GENERAL INFORMATION

**Manufacturer:** Hirtengenger Patronen-, Zundhutschen-und Metallwarenfabrik Aktiengesellschaft, A.2552 Hirtenberg, No. Austria.

**U.K. Distribution:** Ripmax Ltd., 80 Highgate Road, London, N.W.5.

**Type:** Throttle-equipped shaft rotary-valve glowplug engine with twin ball-bearings and ringed aluminium piston.

**Bore and Stroke:** 24.5 x 21.0 mm. (0.9646 x 0.8268 in.)

**Stroke/Bore Ratio:** 0.857:1

**Displacement:** 9.900 c.c. —0.6041 cu. in.

**Checked Weights:**

(i) 421 grammes—14.86 oz. (less silencer)

(ii) 496 grammes—17.49 oz. (with HP silencer)

**Prices:** £21.00 less silencer, less glowplug.

£23.50 with silencer, less glowplug.

needle in or out. Main mixture control via orthodox needle-valve assembly installed in opposite side of throttle housing. Effective choke area approximately 26.5 sq. mm.

**Silencer.** Specially designed for HP.61F engines. Pressure diecast aluminium alloy expansion chamber into which is inserted slotted steel exhaust tube with 11 mm. i.d. outlet nozzle. Expansion chamber has integral rectangular section duct to fit over engine's exhaust stack and is secured with two quick release clips. Domed front end of silencer retained by 4 mm. alloy countersunk screw which enters blind end of exhaust tube. Silencer outlet area: 95 sq. mm.

### Test Performance

Our test sample was a standard production HP.61F supplied through the U.K. importer. The engine was fitted with a Fireball long-reach glowplug of medium heat rating and was then carefully run-in for a total of one hour in short runs using a straight 75/25 mixture of methanol and castor-oil. A switch was then made to our standard R/C test fuel containing 5 per-cent pure nitromethane and, following a few more runs, tests were begun. Atmospheric temperature at the time of testing was 60 deg. F (15 deg. C) and barometric pressure was 30.30in. of mercury.

**Starting and Running.** The starting qualities of the HP.61F were quite good right from new. The new single-ring piston provided good compression seal and although normal hand starts sometimes resulted in the engine starting off in the reverse direction (a habit not unknown with some other makes of course) the HP was not in the least unpleasant to handle, showing no viciousness even when acutely under-propped.

We have had occasion to handle, in all, six HP.61's of various types and two earlier production models had not been such good starters as the present 61F, but one feature that all of them had in common was a below-average vibration level.

**Power.** The advertised power output for the HP.61F is 1.42 bhp at 14,800 rpm, presumably without silencer and running on the suggested straight fuel blend of methanol and castor-oil. While manufacturers' claims are often exaggerated, this certainly does not appear to be an excessively optimistic claim since the gross output

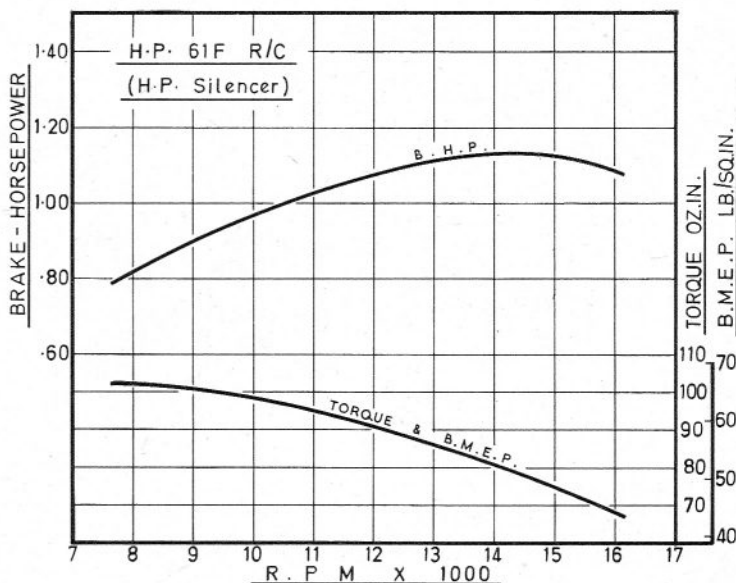


figure (less silencer) for our test unit, with the help of 5 per-cent pure nitromethane in the fuel, came close to 1.30 bhp at just over 15,000 rpm. This is one of the highest ever recorded in the RADIO MODELLER test series.

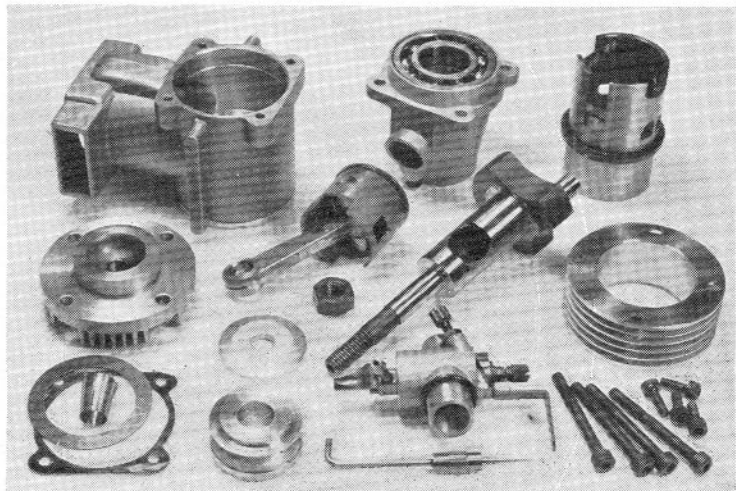
Equally impressive was the very good performance recorded with the silencer added (see graph). As was found in an earlier test on the rear-induction HP.61, this silencer causes a quite modest reduction in power yet provides somewhat more effective silencing than the rather noisy extractor type low-loss silencers often favoured for contest work.

One thing that should not be overlooked is the engine's much above average low-speed torque,

an important advantage when it may be necessary to use a large diameter prop, as for a big scale model.

Prop rpm tests on the HP.61F, using 5 per-cent nitro fuel and with the silencer gave the following figures: 14 x 6 Top-Flite standard 8,550 rpm; 14 x 4 Top Flite standard 10,300 rpm; 13 x 6 PAW Trucut 9,100 rpm; 13 x 5 1/2 Top-Flite standard 10,300 rpm; 12 x 6 PAW Trucut 9,900 rpm; 12 x 6 Top-Flite maple 10,800; 12 x 5 Power-Prop standard 11,800 rpm; 11 x 8 Top-Flite maple 10,700 rpm; 11 x 8 Power-Prop standard 11,400 rpm; 11 x 8 Power-Prop maple 10,600 rpm; 11 x 7 1/2 Rev-Up

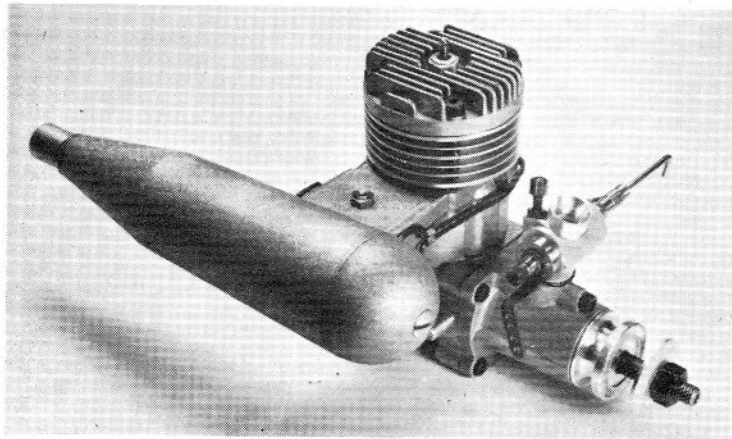
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## ENGINE TEST

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11,200 rpm; 11 × 7 Top Flite maple (2 examples) 11,100 and 11,500 rpm; 11 × 6 Top Flite maple (2 examples) 12,200 and 12,600 rpm; 11 × 6 Power Prop



maple (2 examples) 12,700 and 13,200 rpm.

*Throttling.* Except for a rather awkwardly placed throttle stop screw, making it difficult to loosen or retighten the locknut without removing the carburetor from the engine, the HP.61F R/C throttle is both simpler to adjust and more effective than the earlier HP type as fitted to the rear induction HP.61 R/C. We found the idle mixture control responsive and had no difficulty in quickly establishing a setting that would give a safe 2,500 rpm idle on an 11 × 7 prop with smooth transition between the idle and full throttle position.

### Comment

Obviously one of the most powerful of current 10c.c. R/C engines. Easy to handle, runs smoothly and has a good throttle. Good silencer. Reasonable weight. Excellent value.