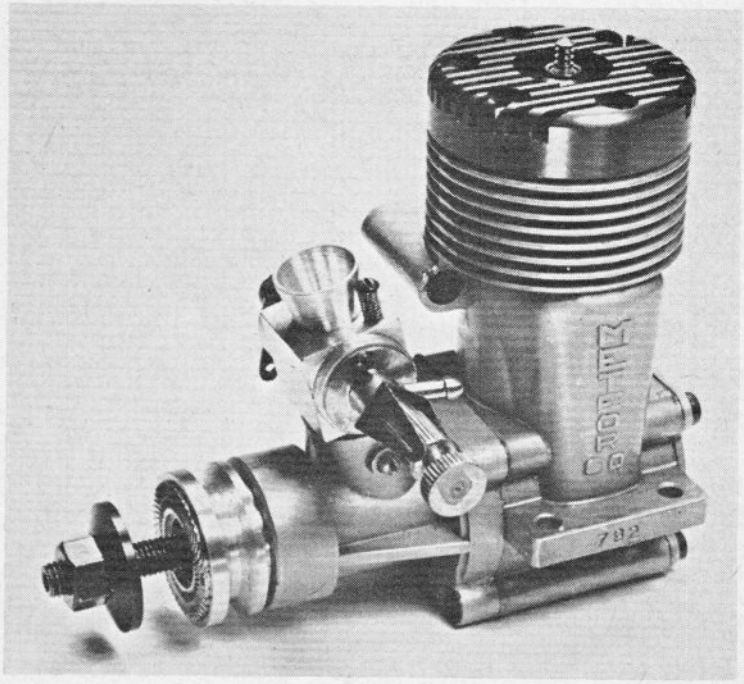
Peter Chinn tests the METEOR 60 R/C



British motor from a new manufacturer with many practical features

PROTOTYPES of the Meteor 60 (originally called the Midwest 60) have been in existence for the past two years and were flown extensively and convincingly last season by Terry Cooper and Keith Jones. These engines and a subsequent small pre-production batch used sand castings. Delivery of production (pressure diecast) models began in early March, this year.

The Meteor is of orthodox modern design and robust construction and offers a number of options and accessories. These include an "export" model with Kavan carburettor, a water-cooled marine version and the choice of a special Meteor silencer or modified versions of certain proprietory silencers including the K8 type shown. (The Meteor silencer was not available until shortly after this report was completed.)

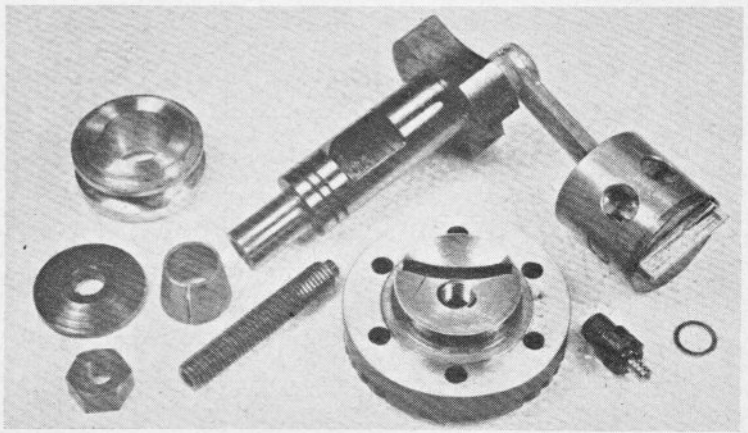
Design and Construction Summary

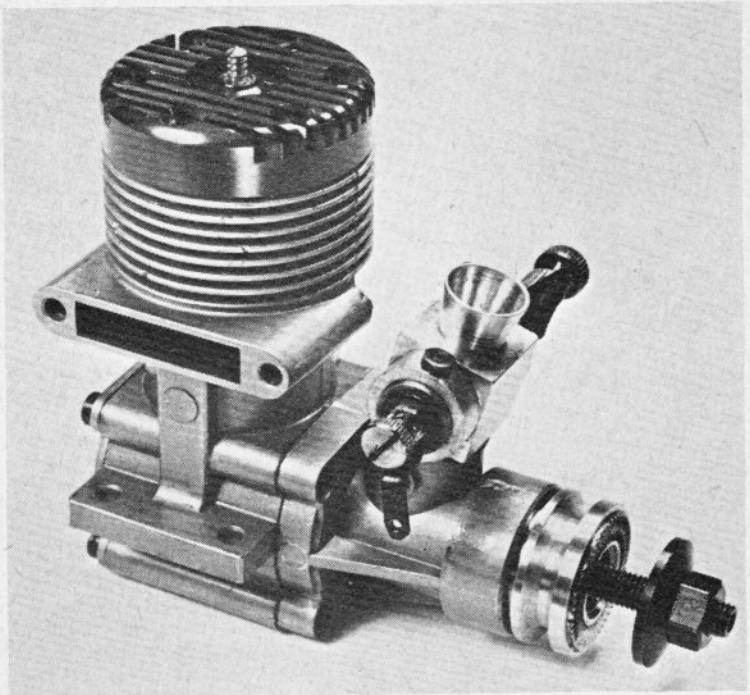
Main Casting. This comprises the crankcase barrel and full length cylinder casing in pressure diecast aluminium alloy. It includes substantial beam mounting lugs and a wide exhaust duct, the ends of which are drilled and counterbored for the silencer fixing screws.

Cylinder. Integral part of main casting with pressed-in hardened steel liner. Five exhaust ports timed to open and close 68½ deg. each side of BDC. Four transfer ports timed to open and close 56 deg. each side of BDC. Two 7 mm. dia. skirt ports.

Crankshaft and Prop Drive Assembly. Counterbalanced hardened steel crankshaft having 15 mm. dia. main journal, ⅜ in. dia. front journal and 9/32 in. dia. pressed-in crankpin. Rectangular valve port timed to open at 47 deg. after BDC and close at 45 deg. after TDC and admitting gas to 10.5 mm. bore gas passage through main journal. Machined aluminium prop driver fitted to steel split taper collet on front journal. Replaceable ¼ in. prop stud with hex socket for Allen key.

Front Housing and Backplate. Pressure diecast aluminium alloy bearing housing with ½ in. i.d. intake boss for carburettor and containing one 15 mm. × 32 mm. 8-ball (rear) and one ⅜ in. × ⅞ in. 7-ball (front) brass-caged ball journal bearings. Housing aligned in crankcase by o.d. of rear ball-bearing and attached with four Allen cap screws. Pressure diecast aluminium alloy crankcase backplate attached with four screws. Paper gaskets.





GENERAL INFORMATION

Manufacturer: Meteor Engineering, 33 Station Road, Erdington, Birmingham 33.

Distribution (Domestic and Export): Keith Jones, Radio Control Models, 131 The Boulevard, Sutton Coldfield, Warwickshire.

Servicing and Repairs: Jim Herbert, 29 Buchanan Road, Walsall, Staffordshire.

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

Bore and Stroke: 0.940in. x 0.875in.

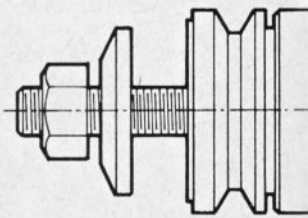
Stroke/Bore Ratio: 0.931 : 1.

Displacement: 0.6072 cu. in. = 9.950c.c.

Checked Weights:

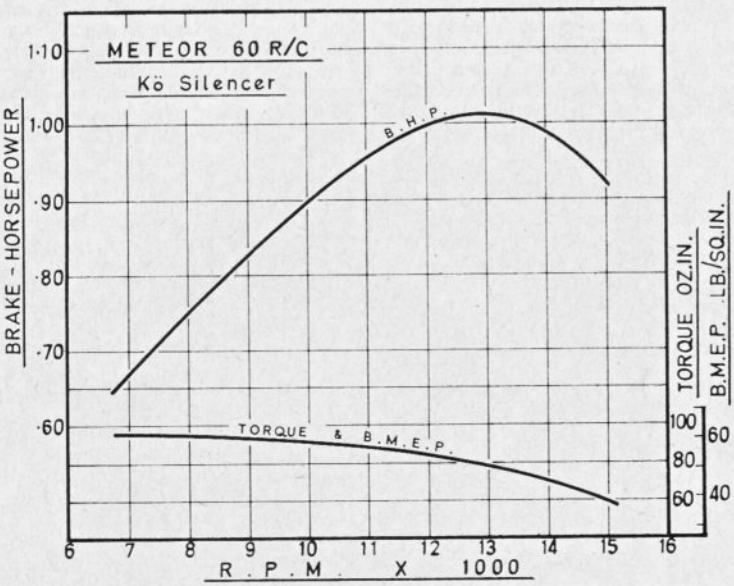
(i) 462 grammes—16.3oz. (less silencer)
(ii) 546 grammes—19.3oz. (with Kö expansion chamber)
(iii) 549 grammes—19.4oz. (with Kö extractor silencer)
(iv) 568 grammes—20.0oz. (with Powermax silencer)
(v) 575 grammes—20.3oz. (with Meteor silencer)

Also Available: (i) Export model with Kavan carburettor.
(ii) Water-cooled marine model with flywheel.



Piston and Connecting-rod Assembly. Diecast aluminium alloy piston with flat crown, straight baffle and two 7 mm. dia. skirt ports. Single Dykes type piston ring. Forged aluminium alloy connecting-rod with bronze bushes and oil holes at both ends. Pressed-in ¼ in. dia. gudgeon-pin.

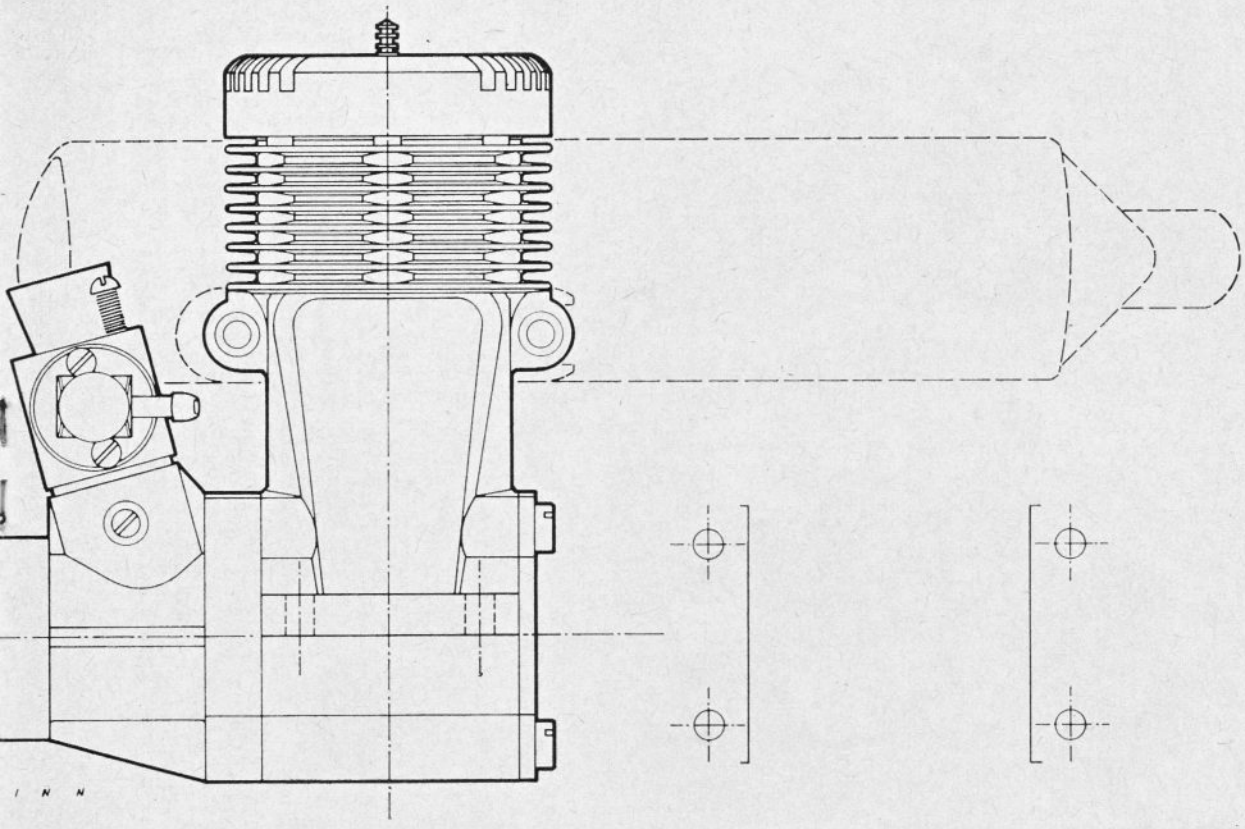
Cylinder head. Machined aluminium alloy, finned, and attached with six screws without gasket. Shallow hemispherical combustion chamber, slotted for piston baffle clearance but without squish area. Centrally located long-reach glowplug. Cylinder head had red anodised external finish.



Carburettor. Barrel throttle type with automatic mixture control. Machined aluminium alloy carburettor body with ground steel throttle barrel incorporating idle needle. Strength of low speed mixture adjustable by screwing idle mixture needle in or out. Main mixture control via an orthodox needle-valve assembly installed in the opposite side of the carburettor body. Choke diameter: 8 mm. Effective choke area: 36 sq. mm. approx.

Silencers. The standard Meteor silencer for this engine is a conventional expansion chamber without baffles, made in two diecast parts comprising a cylindrical bullet-nosed body and duct and a screw-in tapered rear section with 10 mm. i.d. outlet (78 sq. mm. cross sectional area). It includes provision for pressurising the fuel tank via a screw-in brass pressure outlet nipple on the silencer body.

Alternatively, British Powermax and Swiss Kö (Kölliker) silencers (extraction and expansion chamber



type) are available suitably adapted to fit the Meteor. Each of the Kö silencers attaches neatly to the Meteor by means of a pair of screws which pass through the ends of the engine's exhaust stack and into the silencer duct.

Test Performance

Our test sample was selected from the very first batch of production (die-cast) engines to be made and was given approximately 20 minutes running-in prior to despatch. No instruction leaflet, other than one on adjusting the throttle control, was received but we were advised by the distributor that the preferred fuel is a 4 to 1 basic mixture (5½ to 1 has been used with the prototypes) with the addition of 5 per cent petrol under cool climatic conditions and 5 per cent nitromethane for contest work. Normally recommended glowplug is the Swanson Fireball Red (hot) plug. Under hot conditions (high climatic temperature and higher nitromethane percentages) a shielded type Fox or Electrocone may prove to be somewhat better.

Atmospheric temperature at the time of testing was 52 deg. F (11 deg. C) and barometric pressure was 29.75 in. of mercury.

Starting and Running

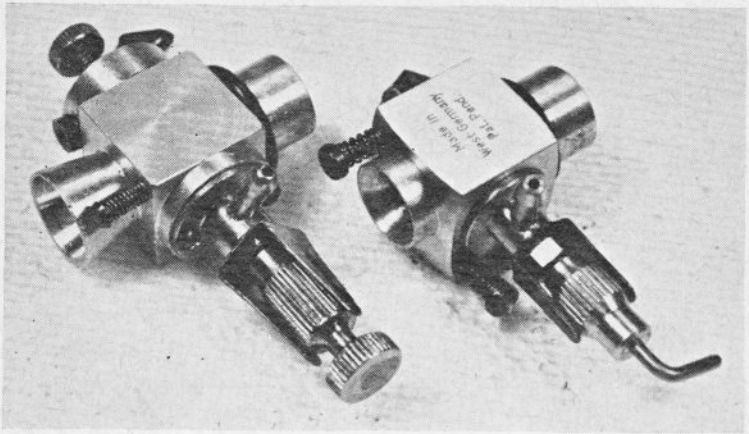
When running any new engine it is our practice never to use less than 25 per cent lubricant in the fuel. We found that although the Meteor had been given a short running-in period in the manufacturer's hands, it ran quite hot and a "cool" straight 75/25 mixture of methanol and castor-oil was therefore chosen.

Hand starting was reasonable at the outset and improved steadily as the piston ring became bedded-in. After about one hour, compression was good and the Meteor started easily on all props. At no time did it show any viciousness—even when provoked with our "docility test": a hand-start on a 9 × 6.

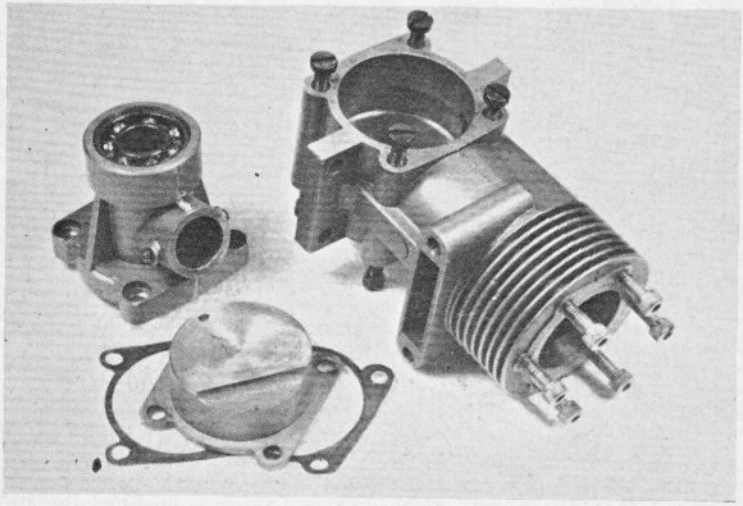
Power

During the first hour or so of accumulated running time the Meteor tended to lose power quite appreciably (about 15 per cent) as it warmed up from cold and for this reason it was given approximately two hours on the bench before any test figures were taken. We then changed to our regular test fuel containing 5 per cent pure nitromethane and made some prop rpm checks. Figures recorded (without silencer) at this stage included 8,700 rpm on a 14 × 6 Top Flite maple, 10,500 on an 11 × 7¾ Bartels fibreglass, 10,600 on an 11 × 8 Top Flite maple, 11,500 on an 11 × 7 Top Flite maple, 12,500 on an 11 × 6 Top-Flite maple and 13,100 on and 11 × 6 Power-Prop maple.

As already stated, the manufacturer's own silencer was not ready at the time of testing. However, of the modified Kö silencers offered by Meteor Engineering for this engine, the expansion chamber type has approximately the same outlet i.d. (10 mm.) and is only slightly larger in volume. This was the silencer chosen for our performance tests. Having a



The Meteor is available with choice of carburettors.



fairly generous outlet area (78 sq. mm.) and no baffles, this silencer is not particularly quiet but it is better than the extractor or venturi type, yet causes only a very slight increase in power absorption. Power loss, compared with the open-exhaust performance was of the order of 8-10 per cent, equivalent to an rpm loss, over the most widely used part of the power curve, of only 200-300 rpm.

Throttling

Having witnessed the performance of prototype engines in flight, we are aware that the Meteor is capable of providing excellent throttle performance and we were surprised, therefore, to find that with our particular sample, it was difficult to find carburettor settings that would provide an ideal mixture throughout the throttle range. There was no difficulty in establishing satisfactory full power and idle settings but the engine had a tendency to run rich at part throttle. Readjustment to eliminate this mid-range richness resulted, of course, in a weak idle.

It is only fair to point out here that whereas the prototypes were operated on silencers converted to provide a pressurised fuel feed, the silencers submitted with the engine did not have this and all tests were carried out with standard suction feed. On our Meteor, the piston skirt just cleared the bottom edge of the exhaust port for a total of approximately 25 degrees of crank angle around the top of the stroke which would, of course, tend to cause a slight loss of crankcase depression—sufficient, perhaps, to cause a weakened idle mixture. Slight pressurisation via the silencer could help here.

As already mentioned, our test sample was a very early production model and its throttling characteristics may not be representative of all production models.

Kavan Carburettor

Large choke areas tend to accentuate carburettor problems and a large choke area is used by the standard Meteor carburettor in the interests of improved power output. However, the Meteor can also be supplied (primarily for overseas markets because of the wider availability of spare parts) with a Kavan carburettor. This has a choke area approximately one-third smaller than that of the Meteor carb. With the Kavan carb fitted, it was possible to achieve a satisfactory throttle range, including a safe 2,500 rpm idle on an 11 × 8 prop, at the cost of about 300 rpm in top end performance. We found it best to set the Kavan automix device on the rich side and to use the airbleed (which, on the Kavan, is in operation over most of the throttle range) to balance the mid-range and idle mixtures.

Comment

Reasonably priced engine of orthodox design from a new manumanufacturer. Fairly good power output and sturdy construction. Useful practical features include replaceable prop stud to reduce risk of crankshaft damage and an idle mixture control screw that can be adjusted while the engine is running. Test sample ran very hot when new (requiring careful running-in on cool well lubricated fuel mix), and was critical to throttle adjustment but these characteristics may not be shared by average production models. Neat silencer fitting.