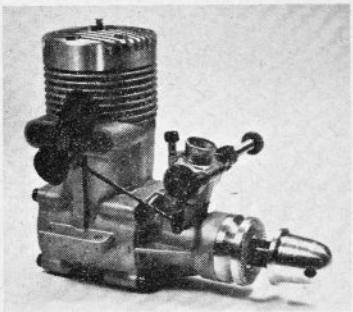
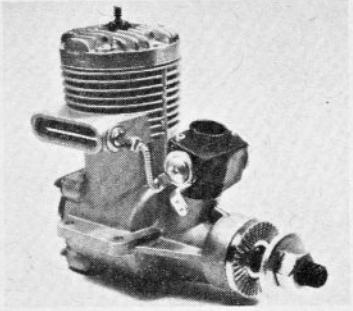
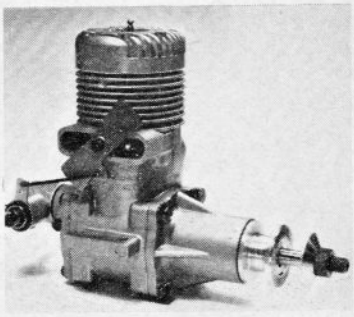


Taipan 61 R/C.



Veco 61 R/C.



Super-Tigre G.60RV R/C.

radio motor commentary

SIXTY ROUNDUP

A look at current production .60 size motors

by PETER CHINN

AT any one time, there are generally around a dozen different 10 c.c. R/C engines listed on the U.K. market, of which at least a quarter are usually at some stage in the process of being improved or replaced by other models.

This can be a bit confusing to the prospective buyer and, although we try to keep pace in R.C.M.&E. with the changing market position, past experience has shown that many readers welcome an occasional attempt to clarify the situation by means of a resume of pertinent data on existing models.

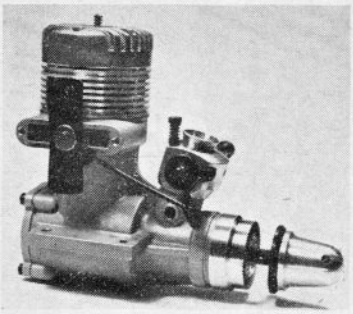
For this article, therefore, we assembled twelve current sixties and from examination of these, prepared the accompanying specification table. In Part II, next month, a second data table will include performance figures and data influencing performance, including port timings, carburettors, choke areas, silencers, etc., for the same twelve engines.

Firstly, a brief word about the *status quo*.

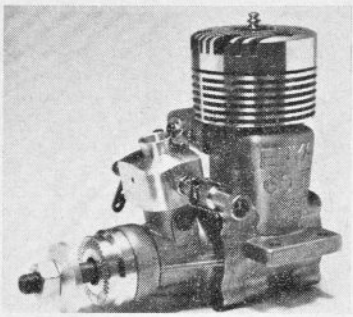
All but one (i.e. the Merco 61) of the engines listed are of overseas manufacture. Three are from Italy, three from Japan, two from Austria, one from Australia, one from West Germany and one from the United States. Not all are necessarily available from stock at all times. This largely depends on whether the importer or distributor is 'on the ball', ordering well in advance of anticipated requirements. Also, heavy demand in other markets for a particular engine may mean that supplies to the U.K. are diminished. This happened with the Enya 60-II, the demand for which was so great in the U.S. following its many successes there, that during the engine's four years of production, the U.S. absorbed practically the entire export allocation from the factory in Japan. The World Championships winning Webra 61 is another engine for which demand has outstripped supply and a similar situation has been developing with the new GP Series O.S. 60s that have been selling particularly well in Germany and their home market.

Of the engines included in our list, the new version of the Enya 60, the Series III, has not yet reached shops in the U.K., but, following the recent acquisition of the U.K. agency by Ripmax, some of these engines should be on sale within the next two or three months. Ripmax will also be offering the new shaft-valve HP 61F and deliveries should begin almost immediately. One omission from our list is the Fox 60. We have not yet had the opportunity of checking out one of these, but Irvine Engines are now importing them and full data will be published in due course.

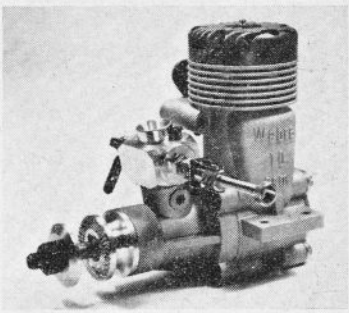
Incidentally, whether an engine is called a '60' or a '61' means little. Most are, in fact, nearer .61 cu. in. than .60 cu. in., and all are within the 10 c.c. F.A.I. limit. The 24 x 22 mm. bore and stroke used by Enya, O.S., Super-



Tarpan 61 R/C.



Enya 60-III TV



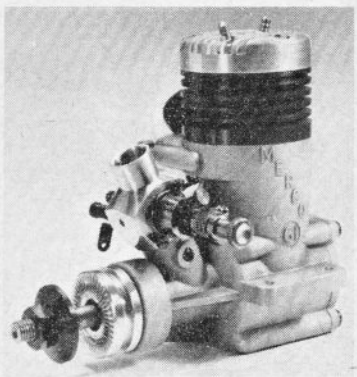
Webra Blackhead 61 R/C.

Tigre (all '60s') and Webra ('61') produces a displacement of just over .607 cu in., as does the 0.940 x 0.875 in. of the Merco and Taipan and 0.940 x 0.876 in. of the Veco (all '61s'). The shorter stroke HP 61s at .604 cu. in. might be more accurately described as 60s.

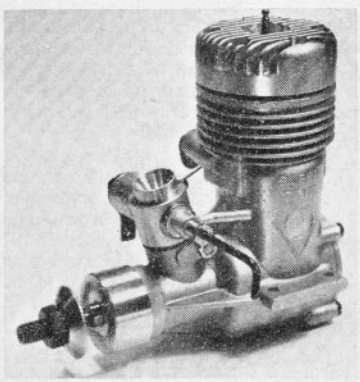
Weight

The weights of 10 c.c. R/C engines have increased substantially since the first examples appeared. These weighed between 12½ and 14 oz. Now, the average weight is around 15.3 oz. and the Super-Tigre G.60 RV R/C scales 18 oz. or 20.6 oz. with standard ST silencer (21 oz. with the latest air-scavenged Super-Tigre silencer). This contrasts rather strikingly with the preoccupation which so many people seem to have with reducing radio installation weight and, for the first time in the history of R/C models, power unit weights now commonly exceed the weight of the entire airborne R/C gear.

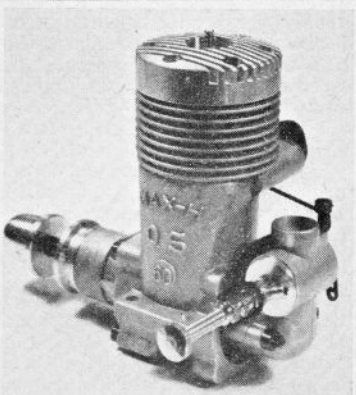
Having regard to the fact that anything over 18-20 oz. for full house radio equipment now seems to be out – most people thinking in terms of 12-15 oz. or less – a little more thought in regard to weight when selecting an engine and silencer may well be desirable if the full advantages of lightweight radio and a lighter model are to be taken. The lightest 60 currently obtainable is the 'ST' series Super-Tigre 60 at 13.5 oz. Better, from the power-weight ratio angle are the O.S.60 GP and 60F GP, especially when the addition of a silencer is taken into account. Interestingly, the O.S.60 started life as a very heavy engine (18½ oz.) in prototype form and was only brought to its present reasonable weight by a two-year programme of further development. Another engine which should offer a very good power/weight ratio is the HP.61F. Our figures refer to the preproduction model but the production version should not differ to any great extent.



Merco 61 R/C Series III



Super-Tigre ST.60SR R/C.

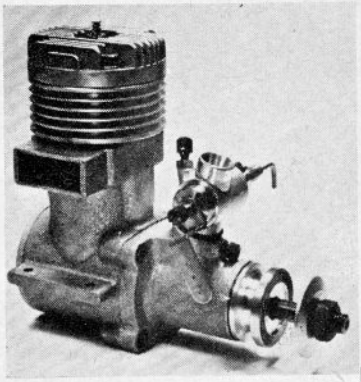


O.S. Max-H,60GP R/C.

Installation

The original Merco 61 and ST 60 (which really led the trend towards 10 c.c. R/C engines seven years ago) were both developments of smaller models and set a pattern as regards installation dimensions. Manufacturers who subsequently offered new models of larger overall dimensions, encountered a certain sales resistance when their engines would not fit contemporary model designs without extensive alterations to engine bays. Engines that will still fit within the Merco/ST bearer spacing include the Enya, the current Series III Merco and ST.60SR, the Taipan and both models of the O.S. With the HPs, Veco and Webra, merely chamfering the inside of the bearers may be sufficient but the G.60 Tigres have much wider crankcases and obviously require relocation of the bearers.

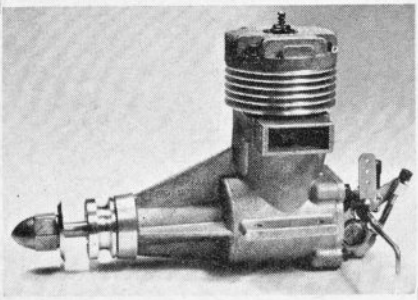
Lengths, measured from the face of the propeller driver



HP 61F R/C (pre-production model).

fuel tank and therefore has to deal with less severe variations in fuel head through manoeuvres. This should mean that a slightly larger venturi can be used for increased top end power. Both the HP 61 and O.S.60 do, in fact, use slightly larger choke areas than in their front induction 'F' models.

All twelve engines have twin ball bearing crankshafts. There is less standardisation in regard to bearings in the connecting-rod and piston. Some engines rely upon the rod and piston material as bearing surfaces, in which case an alloy of adequate wearing properties is usually selected. The majority, however, employ bronzed bushed big-ends and, following a spate of wear troubles with most makes a few years ago, the conrod small-end is also bronze bushed in many instances. In the Enya, Merco, O.S. and Taipan, bronze bushing is now extended to include the

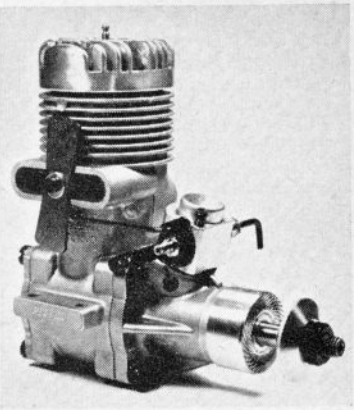


HP 61 R/C

to the rearmost point of the engine, do not vary a great deal so far as the nine front induction engines are concerned and only about 5/16 in. separates the shortest (ST.60 SR) from the longest (Webra 61).

Of the three rear induction engines, only the O.S. Max-H.60GP is of comparable compactness, achieved by combining a short frontal overhang with a vertical carburettor. This, too, is the only engine which, when installed inverted, may have its carburettor relocated upright – a considerable help as regards accessibility and tank location, especially in scale models.

The other two rear intake engines are very much longer. The HP, in fact, is a full two inches longer than the Merco. This and the somewhat inaccessible inclined updraught carburettor have not improved the engine's popularity with the average R/C modeller. On the other hand, there are few motors that will fit more neatly into an 'inverted inline' scale type cowling.



Super-Tigre G.60FI R/C.

General design and construction

The conventional loop or cross scavenged cylinder is still standard wear for large R/C engines and only the HP employs the Schnuerle port system favoured elsewhere in two-stroke circles for high performance. In order to achieve a large bore gas passage (around 11 mm.) through the crankshaft, a 15 mm. dia. crankshaft is used by all the shaft-valve engines with the exception of the Merco which still has a $\frac{1}{2}$ in. (12.7 mm.) shaft. The rear induction engines all use 12 mm. shafts.

Each of the three rear induction motors has a different form of rotary valve, but in all three cases, the valve rotors are of hardened steel and should be less susceptible to the wear problems that have afflicted many rear valves in the past. A well-designed rear rotary valve should offer slightly more performance than a shaft-valve but, in practice, there is usually not very much to choose between the two for normal R/C work, probably because of the breathing restrictions already imposed by R/C type carburettors. Theoretically, there is an advantage in having the carburettor at the rear in that it is nearer the piston bosses. In the Webra, a different solution has been adopted. Here, a smaller diameter gudgeon-pin is closely fitted to the piston and movement is confined to the connecting-rod eye which is equipped with a special needle bearing.

Ringed aluminium alloy pistons are used exclusively. Pistons are mostly machined from bar stock but are die-cast in the Super-Tigre and forged for the Webra. The Enya and Taipan still have two compression rings but most of the others now use a single ring to reduce frictional losses. In the Merco and Veco this is of the Dykes or L-section type in which the ring forms a peripheral extension of the piston crown. On the HP 61, two rings have been used until now but, in the HP 61F, a single ring, pegged against rotation, is featured and this will also be fitted to future production rear intake HP 61s. Being of the Schnuerle port type, the HPs have flat deflectorless pistons. The others use a baffle on the transfer side. Skirt transfer ports, aimed at improving gas transfer and piston cooling, are used by all except Super-Tigre, Taipan and Veco.

To be concluded

SIXTY ROUNDUP— dimensions and specifications

	Enya 60-III-TV	HP 61 R/C	HP 61F R/C (Pre-production)	Merco 61-III-R/C	O.S. Max-H 60 GP R/C	O.S. Max-H 60F GP R/C	Super-Tigre ST.60SR R/C	Super-Tigre G.60 FI R/C	Super-Tigre G.60 RV R/C	Taipan 61 R/C	Veco 61 R/C	Webra Blackhead 61 R/C
SWEPT VOLUME c.c.	9.953	9.900	9.900	9.950	9.953	9.953	9.953	9.953	9.953	9.950	9.962	9.953
SWEPT VOLUME cu. in.	0.6074	0.6041	0.6041	0.6072	0.6074	0.6074	0.6074	0.6074	0.6074	0.6072	0.6079	0.6074
BORE mm.	24.0	24.5	24.5	23.88	24.0	24.0	24.0	24.0	24.0	23.88	23.88	24.0
BORE in.	0.9449	0.9646	0.9646	0.940	0.9449	0.9449	0.9449	0.9449	0.9449	0.940	0.940	0.9449
STROKE mm.	22.0	21.0	21.0	22.22	22.0	22.0	22.0	22.0	22.0	22.22	22.25	22.0
STROKE in.	0.8661	0.8268	0.8268	0.875	0.8661	0.8661	0.8661	0.8661	0.8661	0.875	0.876	0.8661
WEIGHT (less Silencer)	15.1 oz.	16.0 oz.	15.0 oz.	15.2 oz.	14.8 oz.	14.6 oz.	13.5 oz.	16.4 oz.	18.0 oz.	14.7 oz.	14.1 oz.	15.8 oz.
WEIGHT (with Silencer)	18.0 oz.	18.7 oz.	17.6 oz.	17.5 oz.	16.8 oz.	16.6 oz.	16.4 oz.	18.9 oz.	20.6 oz.	16.6 oz. (Tatone 103 Silencer)	17.2 oz. (Mini-Vox Silencer)	18.4 oz.
LENGTH from Prop Driver face	88 mm.	136 mm.	90 mm.	85 mm.	94 mm.	88 mm.	84 mm.	85 mm.	119 mm.	85 mm.	87 mm	92 mm.
HEIGHT crankshaft axis to top of cylinder head	77 mm.	77 mm.	77 mm.	76 mm.	80 mm.	80 mm.	80 mm.	85 mm.	85 mm.	80 mm.	76 mm.	78 mm.
CRANKCASE WIDTH (required bearer spacings)	37 mm.	38 mm.	38 mm.	37 mm.	37 mm.	37 mm.	37 mm.	42 mm.	42 mm.	37 mm.	39 mm.	39 mm.
INDUCTION SYSTEM	Front Shaft-Valve	Rear Bell-Valve	Front Shaft-Valve	Front Shaft-Valve	Rear Drum-Valve	Front Shaft-Valve	Front Shaft-Valve	Front Shaft-Valve	Rear Disc-Valve	Front Shaft-Valve	Front Shaft-Valve	Front Shaft-Valve
SCAVENGING SYSTEM	Cross Loop	Schnuerle Loop	Schnuerle Loop	Cross Loop	Cross Loop	Cross Loop	Cross Loop	Cross Loop	Cross Loop	Cross Loop	Cross Loop	Cross Loop
CRANKSHAFT BEARINGS	Ball journals	Ball journals	Ball journals	Ball journals	Ball journals	Ball journals	Ball journals	Ball journals	Ball journals	Ball journals	Ball journals	Ball journals
front:	9.5x22 mm.	9.5x22 mm.	7.0x19 mm.	8.0x22 mm.	7.0x19 mm.	8.0x22 mm.	7.0x19 mm.	7.0x19 mm.	7.0x19 mm.	12.0x21 mm.	$\frac{3}{4}$x$\frac{3}{4}$ in.	9.5x22 mm.
rear:	15.0x32 mm.	12.0x28 mm.	15.0x32 mm.	$\frac{1}{2}$x1$\frac{1}{8}$ in.	12.0x28 mm.	15.0x32 mm.	15.0x32 mm.	15.0x32 mm.	12.0x28 mm.	15.0x32 mm.	15.0x28 mm.	15.0x32 mm.
BIG-END BEARING	Bronze bushed 7.0 mm.	Bronze bushed 7.0 mm.	Bronze bushed 7.0 mm.	Bronze bushed 6.35 mm.	Bronze bushed 7.3 mm.	Bronze bushed 7.3 mm.	Plain 7.0 mm.	Bronze bushed 7.0 mm.	Bronze bushed 7.0 mm.	Bronze bushed 6.35 mm.	Bronze bushed 7.14 mm.	Plain 6.0 mm.
SMALL-END BEARING	Bronze bushed 6.35 mm.	Bronze bushed 6.0 mm.	Bronze bushed 6.0 mm.	Bronze bushed 5.56 mm.	Bronze bushed 6.0 mm.	Bronze bushed 6.0 mm.	Plain 6.0 mm.	Plain 6.0 mm.	Plain 6.0 mm.	Bronze bushed 6.35 mm.	Plain 6.35 mm.	Durkopp needle bearing 5.0 mm.
PISTON BOSSES	Bronze bushed	Plain	Plain	Bronze bushed	Bronze bushed	Bronze bushed	Plain	Plain	Plain	Bronze bushed	Plain	Plain
PISTON	Aluminium with baffle 2 skirt ports 2 rings	Aluminium flat crown skirt port 2 rings	Aluminium flat crown skirt port 1 pinned ring	Aluminium with baffle 2 skirt ports 1 Dykes ring	Aluminium with baffle 2 skirt ports 1 ring	Aluminium with baffle 2 skirt ports 1 ring	Aluminium with baffle 1 Dykes ring	Aluminium with baffle 1 ring	Aluminium with baffle 1 ring	Aluminium with baffle 2 rings	Aluminium with baffle 1 Dykes ring	Aluminium with baffle 2 skirt ports 1 ring