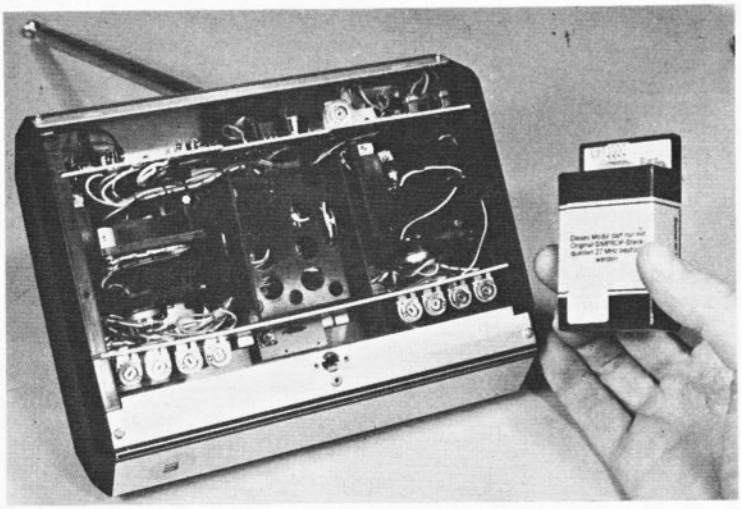
RM
EQUIPMENT REPORT

We look at an outfit with a difference—the interchangeable r.f. module . . . .

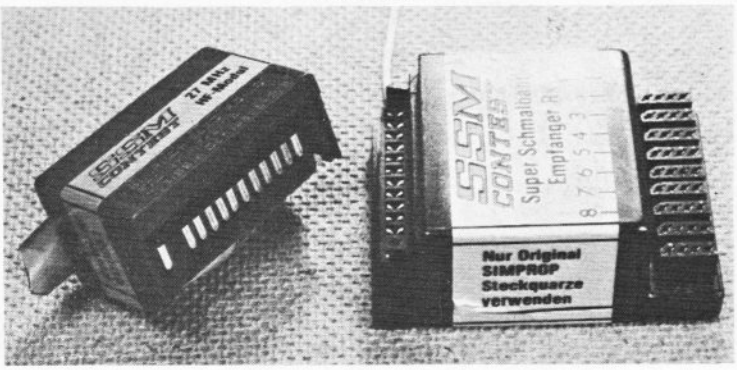
SIMPROP SSM *CONTEST*

AS RADIO control systems tend to become more highly developed these days, one wonders what new facilities will be offered to the eager modelling public. True, a simple four function outfit will still be adequate for the average power modeller, but finer handling qualities, safer operating in busy areas, extra control facilities, and now more recently the capability to operate in several frequency ranges, nowadays tempt one to become more sophisticated in the choice of control equipment.

The Simprop SSM Contest System has been designed to meet continental requirements for narrow-band operation, and has *plug-in R.F. modules* for both transmitter and receiver which employ sine-wave narrow-band modulation. This permits close frequency spacing, and the manufacturer claims that interference from 'walkie-talkies' will not be experienced. In the U.K., 32 channels can be utilised on 27MHz, and 39 on the 459MHz band (modules for the latter, now in preparation, should be available shortly). Overseas, the capability is 20 channels on 35MHz and 4 on the 40MHz bands. Indeed, Simprop have been using this 'SSM' system for some years—it is not FM.



Main feature of the SSM Contest is the plug-in R.F. module, to facilitate speedy change of frequency band. The module, seen held, right, fits into centre compartment of transmitter, plugging into top p.c. board., *Below* receiver (right) uses similar system—module, with crystal, seen on left.



TRANSMITTER

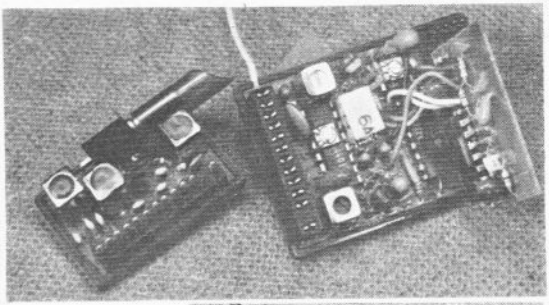
Externally the configuration is fairly orthodox in layout, with the exception of a three-position toggle switch for one of the auxiliaries. This is located between the stick units, which have thumbwheel trims on separate pots (45 'clicks') and purpose-made, large radius pots on the main controls. The stick units are of the drum type and have cam centring and alloy stick ends, which may be removed for the substitution of longer ones. The retract switch is positioned at top right, and two more auxiliary controls are located centrally on the front face.

The battery state is indicated by a flashing green light which reduces in frequency as the batteries run down, there being about 10 minutes' power left when it stops. The flashing may be more noticeable than a meter or a plain pilot light when the transmitter is accidentally left on. The on/off switch is a slide type on the top left of the case, and the aerial is mounted on a ball-and-socket joint so that it may be angled to suit the individual operator; it is adjustable for the friction level and may be removed for transit.

The back of the case is secured with a Dzus-type fastener and two lugs. There is a clear plastic panel to reveal the code number and colour of the r.f. module used. The crystal inserted in the r.f. module is accessible at the side, after removing the back panel. The case itself is in brushed aluminium with textured black plastic end-caps.

Inside, the electronics are disposed on three boards; the lower one has the encoder, the upper one the mixer and amplification stage with a plug for the R.F. module (which, on examination, reveals a well screened oscillator and R.F. stage). A small centre board carries the electronics allied to the auxiliary controls, and two tubes below contain the nicads. At the top left hand corner of the end plate there is a Din plug to accept either the charging lead or 'buddy box' plug.

The change-over from "throttle left" to "throttle right" may be made easily by re-setting the friction screws and transposing a centring spring, which is quite readilya ccessible on the relatively large stick units. As supplied, say the instructions, one has the option of selecting either smooth or ratchet



Above: uncased receiver and module. Left: plugged together and cased.

throttle action, but ours was already set up for ratchet. A twist to two screws changed it to smooth action.

When transposing throttle and elevator functions, the centring spring and ratchet spring (if used) have to be transposed. The rate switches, which reduce the throws of the two major axes of the right stick (as supplied but also available in mode 2) are located high in the centre with red levers for ease of identification. The left hand one operates pitch on the right stick and the right hand switch alters roll on the same (right hand) stick. The reduction of throw is adjustable, via pots accessible by removing the back of the case, from "none" up to 70%.

All the controls operate with very smooth action indeed, and the centring is really spot on, thanks to the large dimensions of the stick units themselves. The rate switches do not reduce the trim action when operated.

Size: $7\frac{5}{8} \times 5\frac{7}{8} \times 2\frac{1}{2}$ in. (19.3 × 14.8 × 5.4 cm). Aerial $8\frac{1}{2}$ in. extends to 55 in. (24 cm. to 134 cm). Short sticks project $1\frac{1}{2}$ in. (3.8 cm).
Stick effort: typically $3\frac{1}{2}$ oz. (99.4 gm)
Weight: 2 lb. $7\frac{1}{4}$ oz. (1128 gm.)

RECEIVER

The receiver is in two parts: a plug on R.F module carries the crystal socket with screened coils, a few discrete components and a multi-pin plug which connects to the receiver proper. This consists of two i.f.'s and a ceramic filter plus two i.c.'s each with a tiny preset pot. and sundry discrete components. A second p.c. board carries a further i.c. and extra components, the whole feeding a bank of output sockets and having one end socket for the power input plug. The first part of the receiver is the interchangeable module and locks firmly onto the main case with grooved housings. The plugs all have side exits so that the assembly is compact.

Size: including module $2\frac{13}{16} \times 1\frac{7}{16} \times \frac{7}{8}$ in. (7.1 × 4 × 2.1 cm) aerial $40\frac{1}{2}$ in. (99.2 cm)
Weight: $2\frac{1}{4}$ oz. (63.9 gm)

SERVOS

The 8-function system has "Contest" type servos, but "Tiny C" servos may be obtained to order, these being standard for the other sets. They will be described in this order.

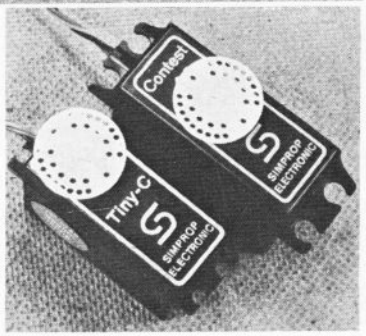
Servos tend to become smaller each time they are re-designed, but for the important contest aircraft, servo size as well as weight seems to take second place to performance. The "Contest" servos have large diameter pots which fix the width of the servos, indeed the motors are housed in sleeves to make up the difference. The gear boxes have nylon gears of generous proportions. A large in-line i.c. obviates the need for discrete output transistors. The gearbox is interesting in that the penultimate gear drives the pot at a ratio of about 2:1, so that the pot wiper traverses a greater arc than it would were it driven directly by the output shaft. The pot is adjustable for neutral via a small setscrew in the case top outside of the arc of the standard output disc.

The case, which is a two piece nylon moulding, has generously gusseted lugs, unlike the "Tiny C" servos which are smaller and have no gussets.

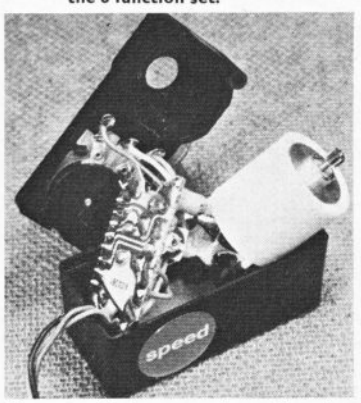
The Tiny C servos are basically similar, but have a direct drive pot and a more compact gear train with a smaller tooth form, resulting in a servo that is narrower and shorter. The cable exit on the "Tiny C" servo is above the lugs, unlike the "Competition" type were the cable appears through a groove below the lugs. The output devices suit both types of servo, being large and small discs as well as levers.

Both servos are very powerful and have excellent resolution, the "Contest" type being slightly faster than the "Tiny C". One of the servos is supplied in reverse mode.

Sizes: "Contest" (including lugs) $2\frac{3}{4} \times 1\frac{7}{16} \times \frac{13}{16}$ in. (7 × 3.6 × 2.3 cm).
"Tiny C" (including lugs) $2\frac{3}{16} \times 1\frac{1}{2} \times \frac{3}{4}$ in. (5.6 × 3.8 × 2 cm).
Weight: "Contest" 2 oz. (57 gm)
"Tiny C" $1\frac{3}{4}$ oz. (49 gm)
Throw: (standard disc) $\frac{5}{16}$ outer hole, $\frac{3}{8}$ in. inner hole. The large disc provides throws up to $\frac{11}{16}$ in. and the arm up to $\frac{3}{4}$ in. The discs have multiple holes to produce a differential throw. The output devices for both types of

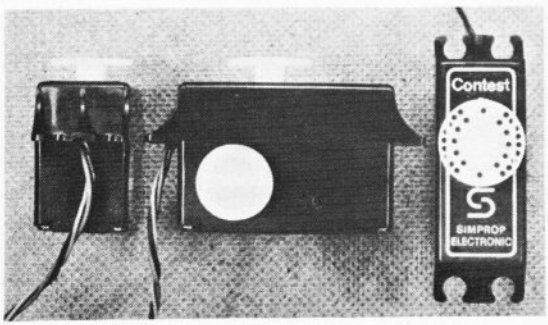


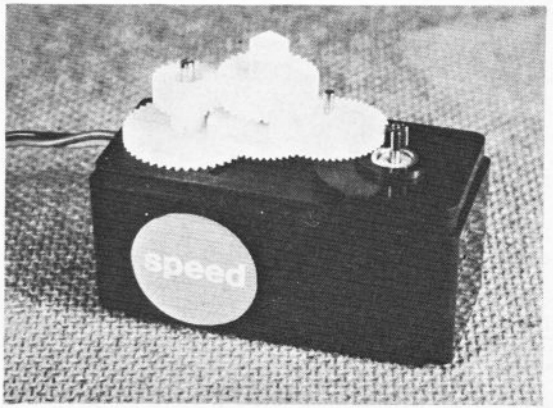
The two types of servo, as described, shown here side by side for size comparison. "Contest" version, standard for the 8 function set.

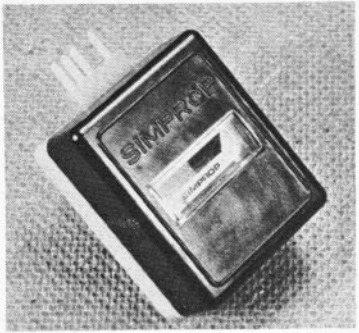


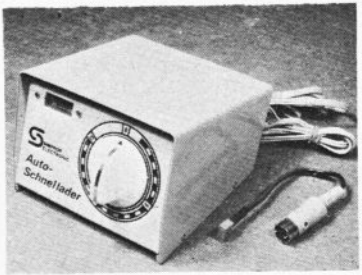
Above and below are shown the electronics and the mechanics of the "Contest" servo, a 3D 3-view at left gives layout.

continued overleaf

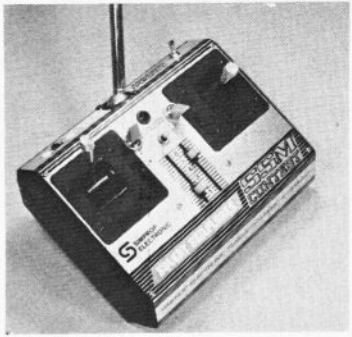








Accessories available include field charger and battery tester for airborne pack.



This view shows how transmitter aerial may be angled, via ball-and-socket.

servo are the same, as are the throws, and the devices fit in a square output shaft.

Power: measurements taken in the outer hole of the standard disc indicate power in excess of 5¼lbs. (2385 gm) for the "Contest" servo and 4¾lbs. (2158 gm) for the "Tiny C".

NICADS & HARNESS

Power is supplied by two pairs of 1.2v sintered nicads of 550mA/h capacity in a flat pack encased in nylon mouldings. A heavy duty three core cable terminates in a feed/charge socket with a matching plug to the switch, which is a small slide type centred on a 12in. cable and equipped with a side entry plug to the receiver. All the plugs and sockets are shrouded and are of the split socket type and the cables are moulded in.

Nicad size: 2⅜ × 1 $\frac{19}{32}$ × 1 in. (6 × 6 × 2.5 cm) cable 7 in. (17.8 cm)

Nicad weight: 5¾ oz. (163 gm)

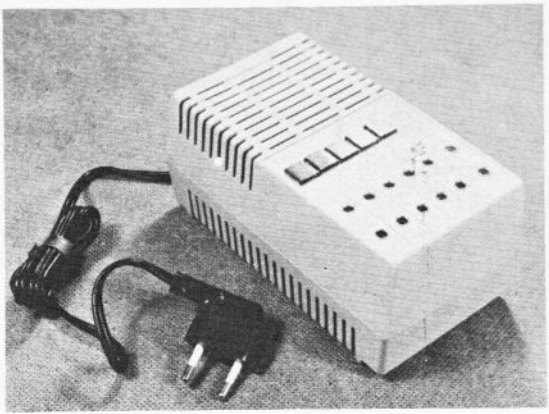
ACCESSORIES

Each servo is supplied with a set of grommets, spacers and mounting screws (the latter for direct mounting), two discs and arm, one pair of crystals and pennant, and charging leads.

Available as optional extras are the longer stick ends, transmitter tray with neck slings, buddy box lead, mains charger—which has multiple outputs for independent or simultaneous charging—and a field charger for separately fast charging receiver or transmitter packs from a 12v car battery. The latter has a meter and clockwork timer and, when tested, charged the flight pack battery in 20 minutes. A small meter is available for testing the state of the airborne battery pack; this plugs into the battery cable in place of the receiver harness and gives a simulated load reading. Various configurations of servo trays are available, as are single quick-release servo clips.

Manufacturer: Simprop Electronic, West Germany.

U.K. Sole Agents and service: Solent Sailplanes, 10-11 Carlton Place, Southampton, Hampshire.



Also available is this multi mains charger and—right—special Simprop servo mounts with clever snap-on locks.