

**RM  
EQUIPMENT REPORT**  
*Imported by  
Irvine Engines —  
the very latest  
from Japan . . .*

## The SANWA 'Custom' FM series



**I**RVINE ENGINES, U.K. distributor of Sanwa radio control equipment now cover the F.M. side of that manufacturer's model products. The "Custom" now to be described is aimed at the serious modeller who requires those extra facilities for his more precise technique of piloting, and which may be needed to satisfy the exacting mechanical demands of 'pattern' flying, helicopters, or valuable scale creations. The way in which these facilities are provided is most interesting, showing that much specialist research has been done to arrive at a final product, that is not only attractive and ergonomically sound, but which has the mechanical efficiency and precision to make it consistent and satisfying to operate.

The 6F-4SNF is six-function, with four servos, and has interchangeable frequency facilities.

### TRANSMITTER

Balancing nicely in the hands, the transmitter case is in dark grey plastic with a stoved paint finish to its aluminium front facing and rear panel. The plastic sub-face carries the inner mechanics and sub-assemblies.

One of the most noticeable features is the use of large 'open gimbal' type stick units which are, in fact, better described as 'drum units'—the stick operates one pot direct and is housed in a drum which is mounted on a plain bearing at one end and drives the second pot at the other end. This system seems very

stable from a mechanical point of view; indeed the action is smooth, even, and centres crisply. The sticks are adjustable for length, having castellated aluminium end-caps which unscrew, to be locked with nuts on the sticks. The throttle action has 30 increments.

The trims, which are positioned slightly below centre, on the inner sides of the stick escutcheons, and below, are remote—each with a separate pot. They have 38 increments of movement and click positively into each. There are reference scales on the stick drums, on the escutcheons and at the side of each trim level. At top right and left are rate switches, each with a preset pot to enable the rates to be set up to provide from 100 per cent, down to 25 per cent. The right hand switch, when thrown to the right, controls the aileron throw, and the left hand one, thrown left, brings in the elevator 'rate'. Because the trim pots are separate, and the rate circuit is allied to the main pot, the trim is not changed when the rate switches are operated.

A circular meter, top centre, indicates output, and the on/off switch and suspension lug are between the lower trims. The switch has a safety lock at both positions; requiring to be lifted when operating. A retract toggle switch is positioned on the case, top right, and an auxiliary lever with incremental action, top left.

The carrying handle is raked forward to clear the telescopic aerial, which is supported in a plastic housing at the case top, and by a metal bracket in the large p.c. board at its

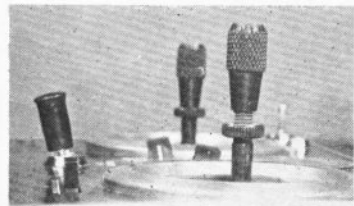
lower end. The crystal socket is recessed and access is gained via a hole in the removable aluminium back panel which, together with the front facing, screens the electronics and is separated from the board by a plastic sheet. The charging socket is in the right hand case side and is of the hollow jack configuration. Nine pencil type nicads are used.

Size: 6½ × 5½ in. (plus 1½ in. over aerial and handle) × 2 in. plus 1½ in. over sticks (or 1½ in. when sticks are extended). The aerial extends to 41½ in.

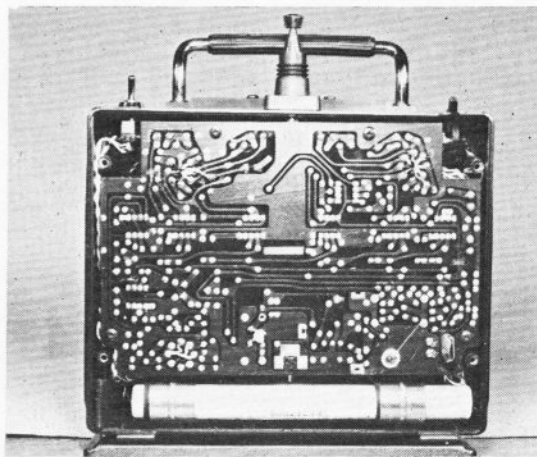
Weight: 2lb. 2.4oz.

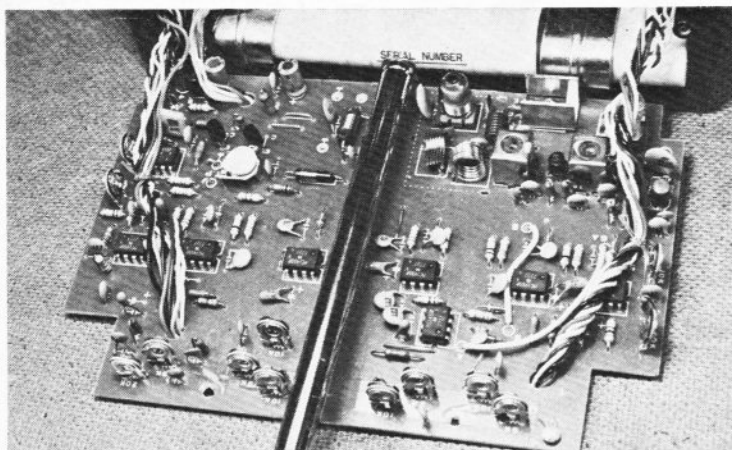
### RECEIVER

The external appearance of the F.M. receiver differs very little from its A.M. counterpart, but in this single deck layout, there are ceramic filters and moulded block components to reduce the discrete count. The crystal socket is accessible via a hole in the two piece



The cleanly 'different' lines of the transmitter are shown up well in these photos, while above close-up shows the adjustable-length sticks. Below: back removed to show p.c. and battery housing.





Transmitter p.c. board, with aerial attached, swung down for our enquiring camera. Right: receiver p.c. equally neat from "landed" side.

case—strong nylon mouldings these, with recessed sockets for the various outputs and a cable for the power input.

The outfit includes a set of wire pigtail braids and a nylon clevis equipped pushrod for throttle operation, to obviate metal-to-metal 'noise', should the linkage be made without insulating components.

Size:  $2\frac{1}{2} \times 1\frac{1}{8} \times \frac{1}{2}$  in. (plugs, when inserted, project only by the thickness of their cables—about  $\frac{1}{8}$  in.), power cable: 6 in.

Weight: 2oz.

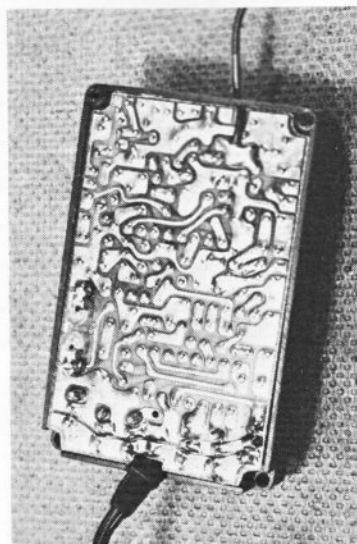
#### SERVO

The servos, too, on casual observation seem similar to the standard types, but inside it is a very different story. The main bearing has a ball race of metal construction and of engineering quality. This is raised slightly in a housing nearer to the output disc, so that the load is taken where it matters. The lower end of the shaft does not engage in the feedback

pot, but has a separate bearing, and drives the isolated pot via gears. The gearbox is all metal and has small tooth gears arranged in a circular unit of watch-like precision. The final gear is nylon, with a limited number of teeth to prevent 'cycling'.

The nylon case encloses an i.c. amplifier and 16mm motor below, and the top seats on a p.v.c. gasket while there is a sealing "o" ring on the output shaft. The output disc fits on splines to provide adjustment for differential and there are six arms, each with two holes for selecting the throw. The cables are flat, three-wire types and terminate in solderless polarised receptacles, having sprung contacts. The servos have special moulded rubber pads fitted to their lugs which are furnished with brass spacers so that the servos are cushioned against shocks from screws or bearers. Two servos of normal sense and two of reverse sense are supplied.

In operation the servos are particularly



quiet, positive and powerful, pulling some 5lb. in the inner hole. There is no noticeable backlash in the gear train and no overshoot. The trim control response is exceptionally precise, showing the high degree of resolution.

Size:  $1\frac{1}{8}$  in. plus  $\frac{1}{16}$  in. lug each end  $\times 1\frac{1}{16}$  in. deep plus  $\frac{1}{4}$  in. over disc  $\times \frac{1}{4}$  in. wide, cable 11 in.

Weight: 2oz.

Throw:  $\frac{1}{16}$  in. inner hole,  $\frac{1}{8}$  in. outer hole. Trim  $\frac{1}{16}$  in. max.

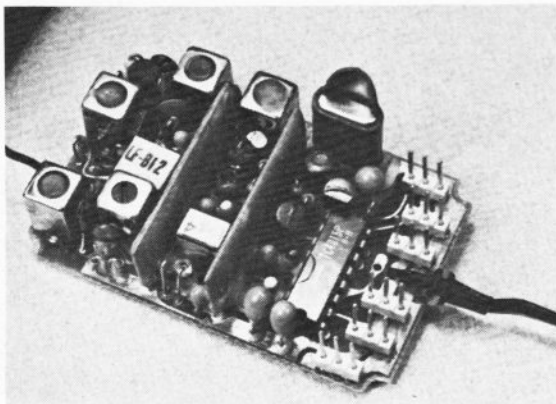
Transit: Typically 0.5 sec. limit to limit.

Power: 5lb. (typically) inner hole.

#### NICAD and SWITCH

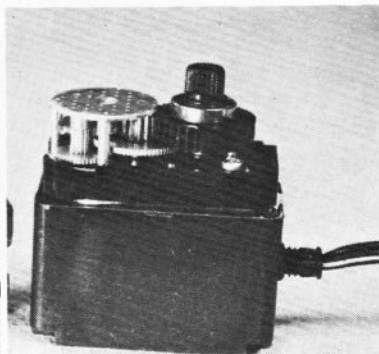
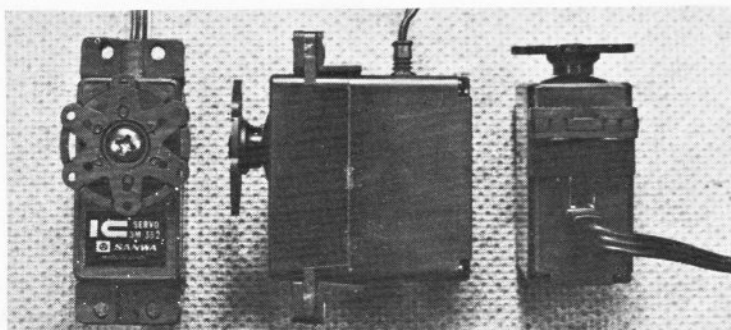
The power supply is a flat four-pencell size set of nicads of approx. 500mAh capacity wired to a socket, which connects to the switch harness with encased multi-pole slide

Receiver with, and without, case.



—continued on page 37

Our "photo-three-view" of servos—brass gearbox is seen at right.



# SANWA FM

—from page 32

switch, and further cable with socket for the receiver plug. It is necessary to disconnect the battery socket from the switch harness for connecting the charger.

Battery size:  $2\frac{1}{4} \times 2 \times \frac{3}{16}$  in., cable  $7\frac{1}{2}$  in.  
Switch cable total 12 in.

Weight: 4.3oz.

Switch and harness weight: 0.75oz.

Airborne weight: 4 servos 13.5oz.

## CHARGER

The transmitter and receiver nicads may be mains charged together or independently

from a 220V A/C supply. Twin L.E.D.s indicate an 'on charge' condition.

Size:  $2\frac{3}{8} \times 1\frac{1}{8} \times \frac{7}{16}$  in.

Weight: 6.8oz.

## ACCESSORIES

The system comes complete with one pair of crystals, frequency ribbon, neck-strap, aileron extender cable, mounting screws for servos, receiver aerial tensioner and bonding braids. There is a set of servo mounting trays—a three-abreast one with switch mount and a single mount for the aileron servo. The triple mount has grooves to indicate separation, should the owner wish to have a two-servo mount, with or without the switch incorporated.

A quality product for modellers of discernment who may want to 'up-date' for more reasons than just going 'F.M.'

**Manufacturer:** Sanwa Electric Co., Japan.

**U.K. Distributor and service:** Irvine Engines, Unit 8, Alston Works, Alston Road, High Barnet, Herts.

The Sanwa dual-output charger gives independent or simultaneous charging...

