

## RM looks at the **Futaba P-FJ8**

**Super 'space age' system offers a new dimension for r/c'ers!**  
 Also available in 6-, 5- and 4-function versions—plus a special Helicopter model with extra mixing facilities—the 'J8' is examined here in detail . . .

**T**HIS LATEST "high technology" system from Futaba is aimed primarily at the more advanced flyer, and has been specially developed for competition work—with the FAI aerobatic schedule particularly in mind. Its really "Hi-Fi" appearance, and obviously forward-looking approach have decided us to take a rather longer and closer look than is usual in this feature.

The system has a number of features which should make it especially attractive to those who travel overseas for either contest or holiday flying—the most obvious of which is, of course, its "modular" design, enabling not only frequencies, but actual frequency bands to be changed over in a trice. It should also please those flyers who require pre-set "bang-bang" combinations of controls for certain manoeuvres, together with the ability to asymmetrically reduce

servo throws on the main three functions, and mix main with auxiliary, or auxiliary controls with each other—from the transmitter end.

The fact that the transmitter also provides for the trim adjustment and proportion of 'mixtures'—even reversal of servo direction—should not only bring a gleam to the eyes of the serious user but cannot fail to impress the less ambitious modeller!

First and foremost, as mentioned earlier, the system incorporates plug-in RF modules in transmitter and receiver, which are basically 8-function FM units. Each module has a socket for the appropriate crystal—the transmitter module also decides whether FM or AM\* modulation is sent, although the receiver module accepts either type of signal. The receiver unit itself, however, has to be chosen specifically to suit one or other. Then (assuming the appropriate licences have been obtained), the 27, 35, 40, 53 or 72MHz bands may be used simply by changing over the modules. (Note: at present, only 27MHz is permissible in the U.K.)

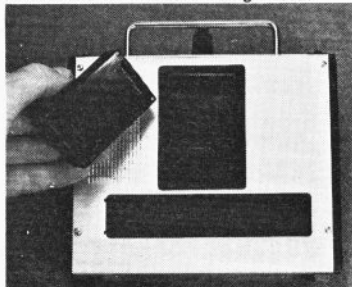
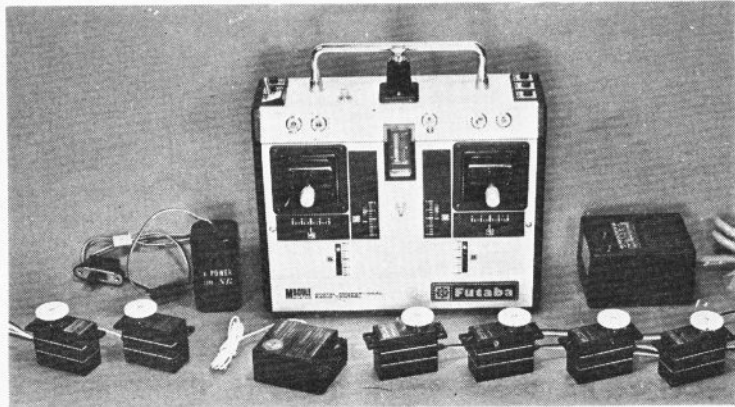
One of the many useful and practical features is the direct cable linkage, to be plugged in to

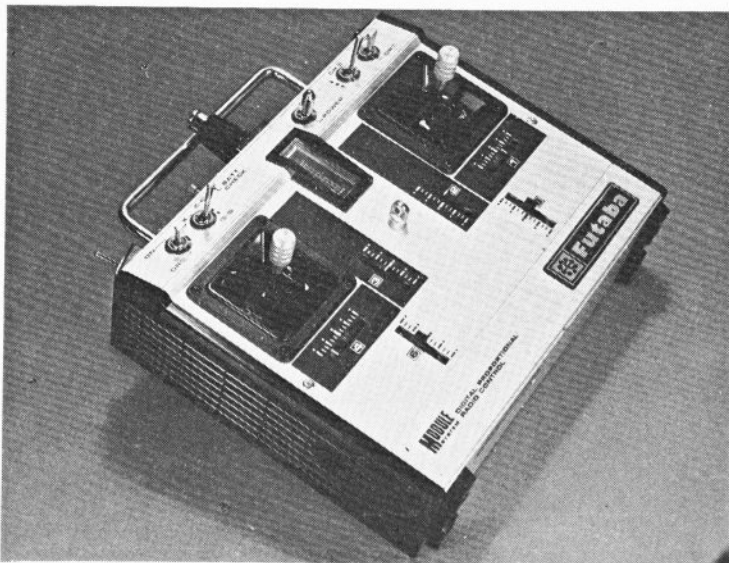
connect the transmitter encoder to the receiver decoder, so that one can operate all the controls without radiating a radio signal—thus saving valuable "air" time while others are flying. Adjustments may be made from the transmitter end, rather than adjusting the mechanical linkages in the model and re-testing. The power consumed by the transmitter is much less than that for normal use, when operated in this way. Now for a more detailed examination of each part of the system.

### TRANSMITTER

The transmitter fairly bristles with levers, switches and push buttons, so that at first sight one gets the impression that a few lessons in accordion playing would be helpful! After playing (with) it for a while, hooked up to the receiver, it became clear how natural the positioning of the controls is. Set up, as was the example sent for examination, in "throttle left" mode the ergonomic layout seems to fit the use of all the available finger and thumbs beautifully. The three main controls are positioned as standard for this mode, and are dual-axis sticks which have crisp, centring and extremely free action. The throttle on the left stick has precise ratchet action, as do the auxiliary levels sited below them. The electronic trim controls have similar action and are immediately below and at the inner bottom corners of the stick units. The elevator trim and throttle trim appear to be transposed, but it is in fact more convenient

Heading is close-up of transmitter, showing all those levers and buttons! At left, the impressive collection includes two extra servos for auxiliary use. Below is shown the RF module being fitted.





to use the left hand to move the elevator trim, which is nearest, to aid smoother operation.

The sticks each drive one pot directly so that it rotates about its shaft; the other pot is fixed to the side of the unit, driven via the housing of the first pot. Each centring unit comprises a spring-loaded level resting on two pegs and gives perfectly slop-free neutrals.

Above the stick units there is an inclined panel which carries (from left to right) lever switches for the following: elevator dual rate, mixing selector for bringing in flaps with elevator or flaps with spoilers (or airbrake). Then there is the on/off switch which is safety-locking, a three position switch for spoiler or airbrake operation and the dual-rate switch for ailerons.

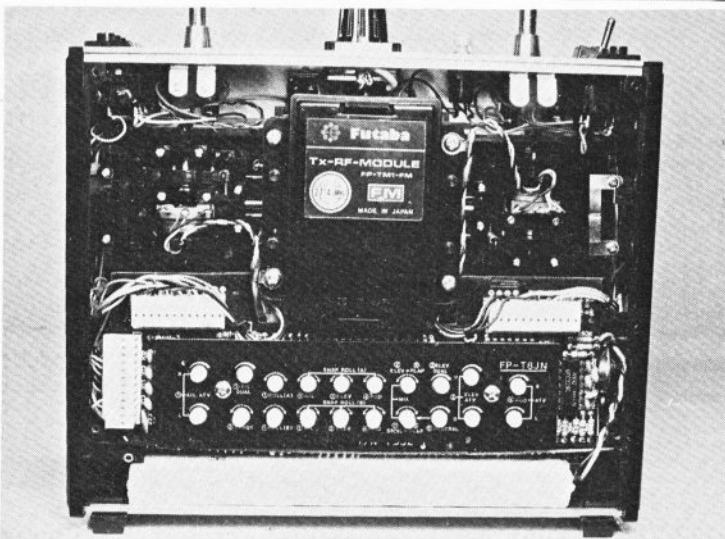
On the top of the case there is the retract switch on the left, behind which are a pair of "snap roll" buttons (L or R) which operate elevator, rudder and aileron servos together. On the right there are L. and R. preset roll buttons which put in a specific amount of aileron—allowing the pilot to concentrate on giving elevator and top rudder as appropriate. Between these buttons is a preset throttle control button which brings in a specific low throttle setting for some manoeuvres. All the control functions and combinations of controls are adjustable individually and in proportion to each other, so that those "bang-bang" servo actions provided by the use of the pushbuttons can be pre-set to suit each model or the type of manoeuvre required. In fact all control functions are trimmable (and most reversible) by adjusting a bank of trim pots at the back of the case, and tiny switches in the receptacle which holds the RF module. This neat electronic facility should make radio installation easier, as it eliminates the need for reverse-mode servos, and mechanical mixers, for all except "elevon" or "V" tail equipped models.

At centre front is a meter which indicates RF output and may also be used to show battery state by pressing a button on top. The aerial retracts completely and its lower section must be locked, by twisting, to transmit.

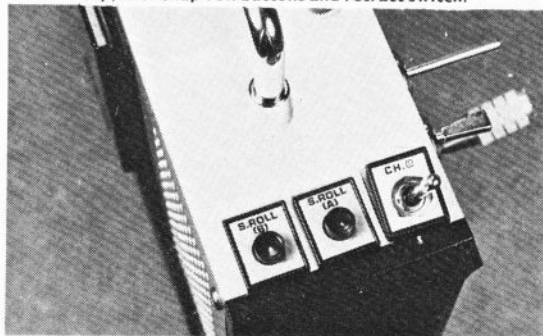
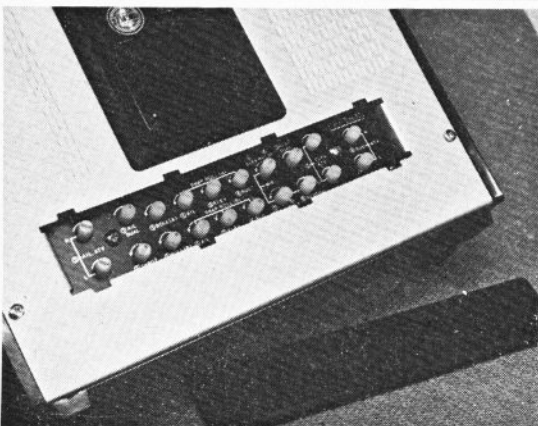
The electronics are on several sub-assembly circuit boards, which are interconnected to each other and to the switchery and stick pots by multi pin plugs and sockets. All this is packed tightly into a case which is made from satin finished extruded aluminium alloy with pressed sheet back panel and plastic end-caps and is styled in a sophisticated manner. The stick lengths are adjustable and there is a slanging lug for the neck strap—essential with so many controls for the nimble fingers to use! The whole impressive hunk of electronics is powered by eight cylindrical nicads of 500MAh capacity, rechargeable via a Din-socket at the side, which also carries contacts for the encoder output to the receiver link cable.

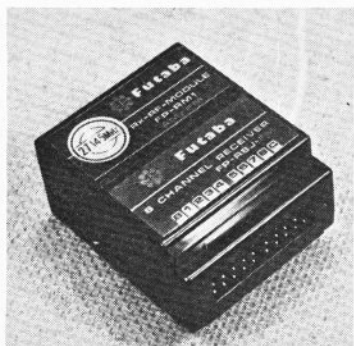
**RECEIVER**

The receiver itself is tiny, being sub-divided from the RF module onto which it plugs. It has a row of clearly identified sockets for the 8



With back removed, the transmitter looks most impressive, though both the RF module and the bank of trim pots are, in fact, accessible without removing the back panel, as shown left. (The module clips firmly in place). Below is a close-up of the left-hand top, with snap-roll buttons and retract switch.





outputs and power and encoder input plugs. The whole is compact in design and strongly cased—those plugs and sockets being particularly small, neatly polarised and crimped onto the leads. Much attention is paid to screening, and the RF modules have ceramic filters and interchangeable crystals.  
**Size** (inc. module)  $1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{8}$  in.  
**Weight** 1.85oz. (52g.)

#### SERVO

Two types of servo were supplied—four FP-S121's, which are standard, and two FP-S121G's which are intended for retract functions and have about twice the angle of throw compared with the standard types. The only difference seems to be in the feedback stage which allows a traverse of about  $160^\circ$  instead of the more usual  $90^\circ$ , and the action is non-proportional.

Both types are water-resistant, having soft plastic gaskets at the case joints and an "O" ring on the output shaft. The cable exit is sealed with silicon rubber compound and the shaft runs on twin ball races and there is no detectable backlash or float. The mounting lugs have holes, rather than notches, for the rubber mounting grommets. A large cruciform output arm is supplied in addition to the standard disc, together with a large diameter plain disc which may be drilled to suit individual requirements. The "G" types also have a stepped triple arm fitting to allow for linkage crossover.

The servos are quiet and fast in operation, devoid of any apparent deadband or overshoot.  
**Size:**  $1\frac{1}{2}$  in. long plus  $\frac{1}{2}$  in. lugs  $\times$   $1\frac{1}{2}$  in. deep plus  $\frac{1}{8}$  in. over disc  $\times$   $\frac{1}{8}$  in. wide, cable  $10\frac{1}{2}$  in. long.

**Weight:** 1.3oz. (36g.)

**Throw:** (standard disc)  $\frac{1}{2}$  in. (5/32 in. trim) Radius of holes  $\frac{1}{8}$  in. Retract  $\frac{1}{2}$  in.

**Transit:** typically .4 sec limit to limit.

**Power:** typically over 4lb.

#### NICAD and switch

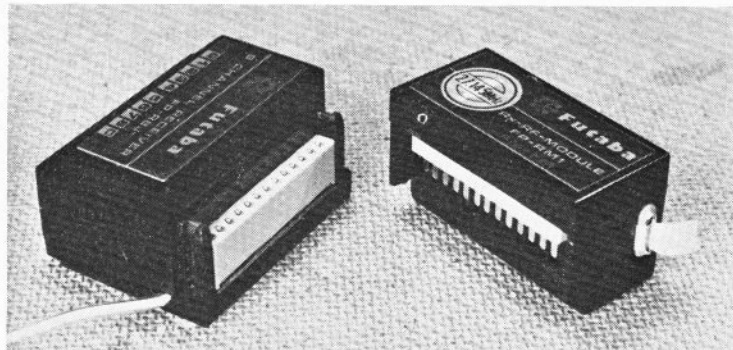
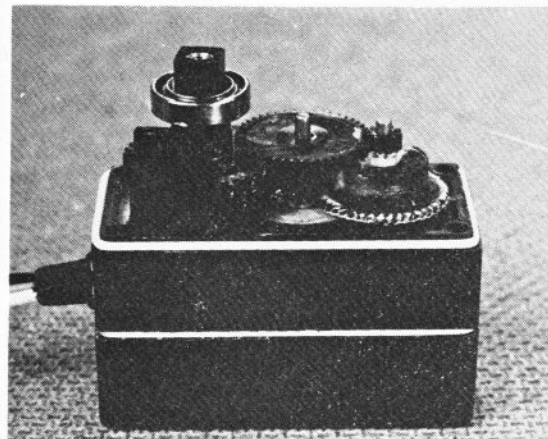
Power is supplied to the airborne system by four cylindrical 500MA/h nicads enclosed in a plastic box. The slide switch is encased and has a charging lead.

**Nicad size:**  $2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$  in. cable  $5\frac{1}{2}$  in. socket to switch 5 in. switch to Rx. 6  $\frac{1}{2}$  in.

**Weight:** total 5  $\frac{1}{2}$  oz.

**AIRBORNE WEIGHT** with four servos less trays, 12oz.

Views of servo, below, show ring gasket i.c. amplifier and ball-race plus generous greasing.



Above, left: receiver—and, above, shown with RF module detached to show flat pin multi connector which joins them. Right: end-shot to show polarising notches. Matching polarised plugs shown in place below.

#### ACCESSORIES

Two types of plastic servo trays are supplied as standard, so that a group of four or two pairs of servos may be mounted. The "4" tray has plastic clamp plates which secure the servos via their grommets, and the double trays have spigots which take the place of the servo grommets. It being the intention to fix the servos rigidly to the tray with screws and washers, then trays are mounted via grommets. This is apparently the reason for the type of lugs used on the servos.

Besides the neck strap, and direct-link cable, there is a lead and shrouded socket to be mounted on the outside of the model for the attachment of this link. The system comes with one pair of RF modules and one pair of crystals. A dual output mains type charger is supplied complete with Din and miniature plugs on appropriate leads.

**Manufacturer:** Futaba Corporation, Tokyo, Japan.

**U.K. Distributors:** Ripmax Models, Ripmax Corner, Green Street, Enfield EN3 7SJ

**Service:** Model Avionics, Bowater Road, Woolwich, S.E.18.

\* Note: the J8 equipment is to be sold only in FM made in the U.K.

