

BILL BURKINSHAW REPORTS ON

# FUTABA J SERIES

## THE LATEST DEVELOPMENT IN R/C TECHNOLOGY TO REACH THE UK FROM JAPAN

FOR as long as RCM&E magazine has been published it has been our policy to provide up to date information on all that is new in the R/C world via our *Commercial Developments* column, and to keep users abreast of developments in R/C Technology via *Test Reports*. With most new products this system works well, but in the case of this new 8 function R/C system from Futaba we feel that something more is required.

It is easy enough to comment upon the smoothness of the sticks, the appearance and even the method by which the transmitter encoder performs its functions, but — very big but in this case, how does an R/C system whose transmitter includes no less than 45 switches, buttons, trims and levers perform on the flying field — how practical are all the features and just how easy are they to adjust? Is it foolproof?

We chose to instal the equipment in a well tried veteran of the flying field — a *Wick 'Johnny'*. This model is very aerobatic, capable of all the manoeuvres that the buttons and switches can be set up to accommodate with the exception of flaps.

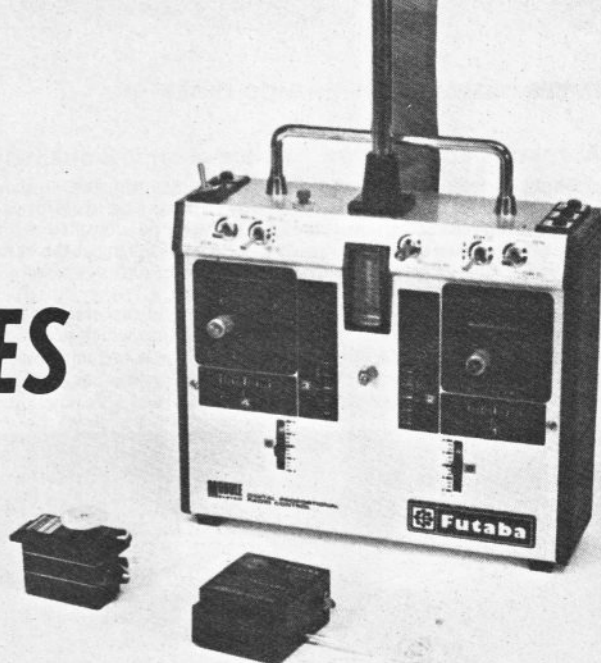
### Installation of the servos

No longer is it necessary to carefully select servos for direction of rotation simply instal them for greatest convenience of pushrod connection, for the transmitter adjustments can cope with servo reverse with the flick of a switch. It is necessary however to remove the RF module from the transmitter to gain access to the reversing switches. A good safety feature this, for an inadvertent click of a switch could spell disaster.

Setting the throttle for open and closed position presents no problem as the travel direction of the throttle servo can be instantly adjusted. At this point a little further information on the layout of the transmitter is worthy of mention. The trims are in funny places! If you are used to having elevator trim alongside the elevator stick this could really confuse you for what appears to be the elevator trim is in fact the throttle and vice-versa. Not as daft as it might seem at first, for in use the primary functions (elevator and aileron in Mode II operation) are both on the same stick (R.H. of course) and the elevator trim, usually the critical one, can be twiddled with the left hand whilst the right hand still retains full control of the model.

Returning to the throttle set up — firstly set the direction of travel to suit the linkage, then set the *ALT* switch to the 'slow' end of the travel and the trim can then be used to adjust the slow running only without it having any effect on the top end position. There is no adjustable throw facility for the throttle so this item has to be checked for freedom to travel to its fullest extremities without locking up.

Whilst describing the throttle set-up the function of one of those many buttons needs



Above: only part of the array of switches and buttons are immediately visible, the remainder are tucked away beneath the Tx., R.F. module and a clip-in panel both shown removed below.



explaining. For arguments sake let us suppose that your model requires a precise amount of throttle 'open', to spin in a satisfactory manner. Normally you have struggled to operate ailerons, elevator rudder and throttle all at once. Trouble no more, a button labelled *Throt* can be used to provide a pre-determined degree of throttle opening at a touch. Also even if 'Snap Roll Button A' facility is pre-set to provide just that manoeuvre. 'Snap Roll Button B' can be set up to provide just the exact amount of rudder, elevator and aileron to provide a spin. Therefore simultaneously pressing the *S. Roll B* and *Throt* buttons provide all the control settings needed for perfect spins everytime. Simple!

Having installed all the servos it is worth considering the possibilities of the Dual Rate facilities before proceeding any further. Dual Rate really means Dual Servo Travel Distance, in the 'off' position the servo travels its fullest distance as the control stick is operated. In the 'on' position a reduced travel facility is available. This could be used for example to provide greater control surface throw for 'deadstick' landings when slipstream effect from the propeller is not helping the control to bite (and also the model will probably be flying more slowly) or it could of course be used to select a predetermined *reduced* amount of control surface throw for a particular aerobatic manoeuvre, for example reduced aileron travel for slow rolls, or fixed amount of elevator for uniform size loops. It does help enormously in achieving a balanced feel to the controls of a model, that is to say aileron and elevator response both the same and both of the right amount. If the dual rate function is to be used as a fine trimming device in this way, then it is advisable to initially set up the controls surface throws to as much as would ever be sensibly needed, and then progressively reduce the appropriate control surface travel until the balance and response is correct.

**Flying and trimming**

Very few modellers relish flying either new models or with new sets of equipment and I am no exception, it takes some little time to become totally familiar with the feel of a new transmitter particularly something like this new *Futaba*. But nonetheless these things have to be done! After locking the aerial — very important this, the aerial is fully retractable and can be pulled out to what appears to be its full length without locking in place, but if this is done the aerial is not connected to the circuit board and only about 6ft range can be obtained. A short pause whilst everybody else on the field has a play and the motor is started and then we are away.

First impressions are of good balance, but the transmitter is heavy, a neck strap is a definite advantage. The elevator trim fooled me once the model was in the air and I fumbled around for some time before remembering its unusual locations, even after several hours flying with

the set I still feel for the elevator trim in the wrong place. The roller ratchet trims work nicely and servo resolution is good enough for one click to be noticeable in the flight path of the model.

After stooging around for a short while the temptation to try out those buttons began to nudge my sub-conscious so ever mistrustful I gained altitude and pressed *S. Roll A* no fuss no bother, a right hand snap roll — *S. Roll B* ditto to the left. Totally undramatic, for as long as I kept the button pressed the model snap rolled, eventually going into a power-on spin with instant recovery on releasing the button. *Roll button A* produced a slow roll far too slow for my ability as a pilot, even with the help of a constant aileron deflection I could not coordinate elevators and rudder well enough to maintain altitude or heading and had to abort with the model in an inverted 45° dive. I finally tried out the *S. Roll B* button and *Throt* button as an instant spin producing system and was delighted with the first time results.

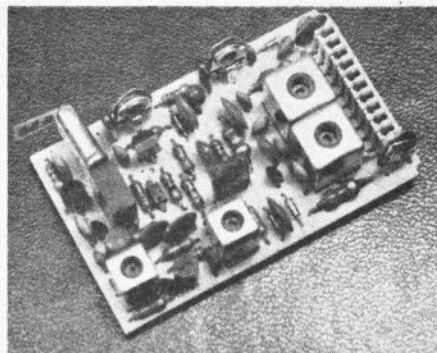
Back on the ground I could have used the closed loop system to observe the effects of my twiddling in the back of the transmitter but an interested audience wanted to see it all done and nobody wanted the green peg!

More throw on *Roll button A* — easy, those slow rolls should be better now! Rolls faster to the left than the right — not uncommon this fault, as torque helps the left roll, but using another useful feature built into the transmitter this can be compensated for.

Aileron, elevator and rudder functions have variable throw either side of neutral. It is a simple matter to therefore turn the *Ail ATV/L* control a smidgeon anti-clockwise to reduce the left hand throw *only* of the aileron servo. Similarly uneven elevator response upright and inverted can be simply compensated for at the transmitter.

A second flight proved that these adjustments do work, *Roll A* was much faster, even I could now cope and left hand rolls were much nearer equivalent in speed to right rolls.

Functions 5, 6, 7 and 8 definitely work, it is a simple matter to prove this and the switches seem as convenient to operate as any ever are. At this point my only real disappointment in this set manifested itself, for despite having inbuilt mixing facilities (the possibility of blending the outputs of two channels) the only possibility for mixing is unlikely to interest the majority of power or even glider fliers. Indeed it is difficult to work out just what sort of modeller would want to mix elevator and flaps — a possibility for aerobatics, or airbrakes and spoilers-scale gliders perhaps. These two odd choices for mixing are the only possibilities at present but we have suggested to the manufacturer, via the avenue of Messrs *Ripmax* the importer, that the versatility of the set would be much improved if it were possible to mix rudder and elevator (for V tail models) or ailerons and flaps (flapperons) and preferably both in preference to the mixes at present offered.

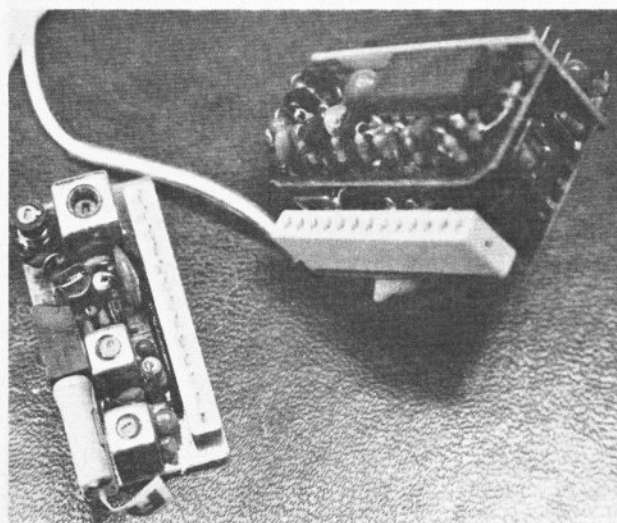


Above: the internals of the Tx., R.F. module. Modules feature plug-in crystals so that the full range of 27 MHz spots can be used. Modules are available for export or overseas competition use on 35, 40, 53 and 72 MHz.

**Overall assessment**

Certainly a very well engineered and carefully thought out system; even those black panels around the trims on the case front are functional — they stop oily finger prints from besmirching the anodised aluminium case front. Controls are conveniently placed and stick action is as good as we have come to expect from *Futaba*. What though does this system offer the average club flier? Well if the facilities already described plus the dual function battery state/RF output meter, interchangeable RF modules to Tx and Rx (both with plug-in crystals) first class servos (ball-raced water-resistant with remote drive feedback pots) adjustable stick lengths and a very comprehensive array of 'extras' such as Y lead, extension leads, neck straps, servo trays, closed loop operation lead are what you want, then this is for you.

What this set will not do is make your models fly better, higher, faster, smoother; this is still dependant on your ability to diagnose the problems then adjust the appropriate control. It will not make a stodgy *Super 60* snap roll, nor would I advise anybody who is incapable of correctly entering and recovering from snap rolls, slow rolls, or spins etc., from attempting to perform then just because the transmitter has a button which says *S. Roll A!* What it can do is allow the experienced pilot the freedom to both trim and personalise the performance of his models with an ease that previously was denied him, for after all it is no easy task to adjust clevises etc., to balance out left and right hand roll-rates. It allows the pilot of experience and judgement to take a little of the margin of error out of some of the aerobatic manoeuvres i.e. spin, loop with snap rolls top and bottom or slow rolls. But remember the pilot still has to have the judgement and experience to know when to press the button down, when to release it and when not to press it at all!



Left: the receiver employs no less than four printed circuit boards, lower left is the 'module' board containing the front end of the receiver with the crystal. Receiver modules to match the TX frequencies are available as described above. Right: servo dismantled to show heavy-duty output gears and twin ball-races. Note the white silicon rubber dust/moisture sealing ring around the gear frame moulding.

