

SO IT'S PRESS FOR LEFT... ...AND PRESS FOR RIGHT

A simple system for
R/C assessed by
David Boddington

BACK in the 60s, when Button Man ruled and Roland Graunchet was but a snotty nosed infant (come to think of it, he still is) single channel radio was the standard form of radio control. Proportional control was in its infancy and highly expensive; at a time when RCM&E was 12.5 pence a Kraft 6 outfit, at £200 represents £2,000 in magazine cost terms. It was only with the advent of less expensive proportional equipment that single channel radio control gradually got behind. A few systems, such as pulse proportional with magnetic actuators, held on – and Mick Wilshire, of World Electronics, still produces the occasional S/C outfit – but to all intents and purpose the button pressing days were dead. Until now!

Ear, ear

Far East manufacturers are very much into the low cost, ready-to-fly R/C aircraft market, both i.c. and electric power. Many of the models feature two or more control functions by Nikko have recently introduced a range of electric powered models using only rudder control. More than that, the transmitter does not have a control stick, for proportional control, but 'left' and 'right' buttons on either side of the case. Closer examination of the airborne unit (the receiver and servo are combined) reveals some interesting facts. Standard power pack is a 4.8volt 100mAh battery and on the side of the unit are a sub miniature on/off switch, a press button, which turned out to be a start switch for the electric motor, and a mini-jack socket. The latter item is to allow you to plug in an ear piece and listen out to see whether anyone is on your frequency! As the radio is on 27MHz frequencies it is not such a silly idea.



Nikko transmitter is as simple as you could wish for. Knob adjacent to 'left' button is for rudder trim.

Switching on the outfit, after fitting six 1.5volt pence batteries to the transmitter, brought more surprises. Pressing the 'left' button produced the required movement on the miniature servo output, but only for a short time before the servo arm returns to neutral. Pressing the right hand button produces similar results, although the return to neutral is more rapid. What Nikko have done is to limit the rudder, on a time basis, to help prevent over control by the beginner and keeps the right rudder to a lower period to allow for engine torque effects. Approximate rudder on times are 0.8 sec left and 0.5 sec right. A small knurled knob on the centre left of the transmitter provides trim adjustment for the rudder.

A lot of spare?

Bear in mind that the outfit is specifically designed for incorporation in ready to fly models and is unlikely to be available as a separate unit. However, there should be a few spare outfits about after 'Junior' has dumped the original model and with these thoughts in mind I decided to carry out some practical tests. What model to use? There was no time to build specially for testing so I sorted out one of my old free flight models called Gringo, circa early 1970s. This had previously been converted to two function R/C, fitted with an Oliver Tiger engine and skis for some exhilarating winter flying. It now reverted to the original Mills 1.3cc diesel power for more sedate flying under rudder only control.

Fitting the receiver/servo/switch combo was simplicity itself; it was servo taped onto the existing servo bearers and the nicad battery popped into the fuselage compartment ahead of the cabin. A modified servo arm was screwed to the servo output and the closed loop cables connected. By making a small hole in the fuselage it was possible to actuate the switch with the help of a piece of aluminium tubing. Even electric motor connection leads came in handy as charging sockets.

It must have been five years since the Mills 1.3cc had been run, but within a minute or two it was purring away, gradually clearing away the 'gunge' from the needle valve. Seeped in genuine single channel flying I forgot that we had the benefit of the rudder trim knob on the transmitter and the first flight ended in a gentle descending turn to the right. With a tweak on the wing trim tab the second airing proved the

Trials begin as the Gringo model is prepared.





It works! With Mills 1.3 purring Gringo flies by under single channel control.

Japanese philosophy of controlled single channel flight. Although the rudder area and movements were minimal the degree of control (given suitable wind conditions) was sufficient to keep flying in the right direction.

Don't panic!

That scourge of the beginner, the panic situation where the button is continually depressed – even though the operator is unaware of this situation – is certainly avoided by the automatic return of neutral of the rudder. Holding on the right rudder does not result in a terminal spiral dive; indeed, it required some nifty button pulsing to obtain a continuous right hand turn. Having a rudder trim knob allows you to compensate for any power-on, power-off variations, although the skilled free-flight modeller would deal with this situation by adjusting the side thrust of the engine.

There's a place...

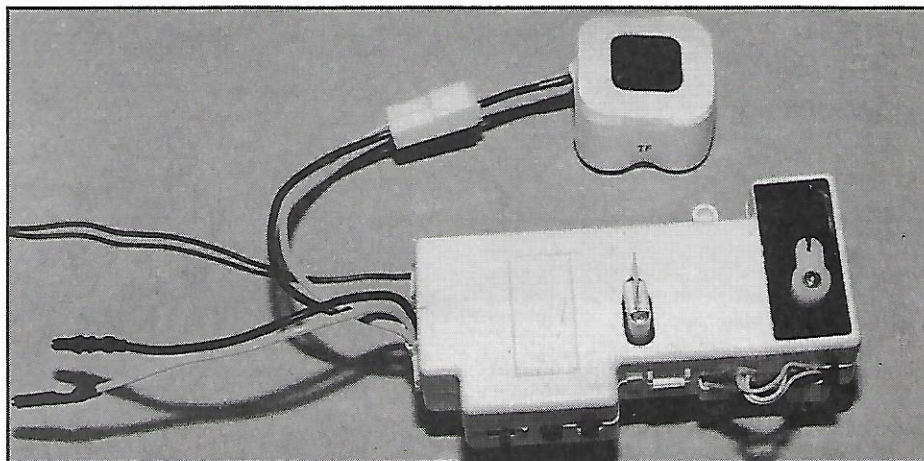
There is still a place, in these days of ever more sophisticated proportional equipment, for the simpler pleasures of life. Single channel may have its limitations but it does work, and there are few more pleasant occupations than pottering around the sky on a warm summer's evening with only a transmitter and fuel can to keep you company. How often this will happen with this particular equipment is debatable. I fear that most of the outfits will be sold through the toy trade and the purchasers will never venture near a model club. Their chances of success, by simply going to the local park and attempting to fly are not promising – and probably illegal. Even with the radio and model improvements and self-neutralising rudder system it will not overcome such atrocities as sideward, vertical or downwind launches. Per-

haps we should be doing more to educate the potential aeromodeller at the source of his purchase. In the meantime I shall relive part of my mispent youth by partaking a little gentle button-pushing, the other activities of my youth are far too strenuous!

And by the way...

The cost of the complete ARTF Sunlight 7 model, electric motor, and radio outfit, requiring only the transmitter batteries, is in the region of £90.00.

Check in toy shops for Nikko model availability. The distributor, TASCOS, may be contacted at 2 Tewin Court, Tewin Road, Welwyn Garden City, Herts AL1 1AU. Tel: 0707 376660.



Removed from its original home, airborne pack shows compact layout.

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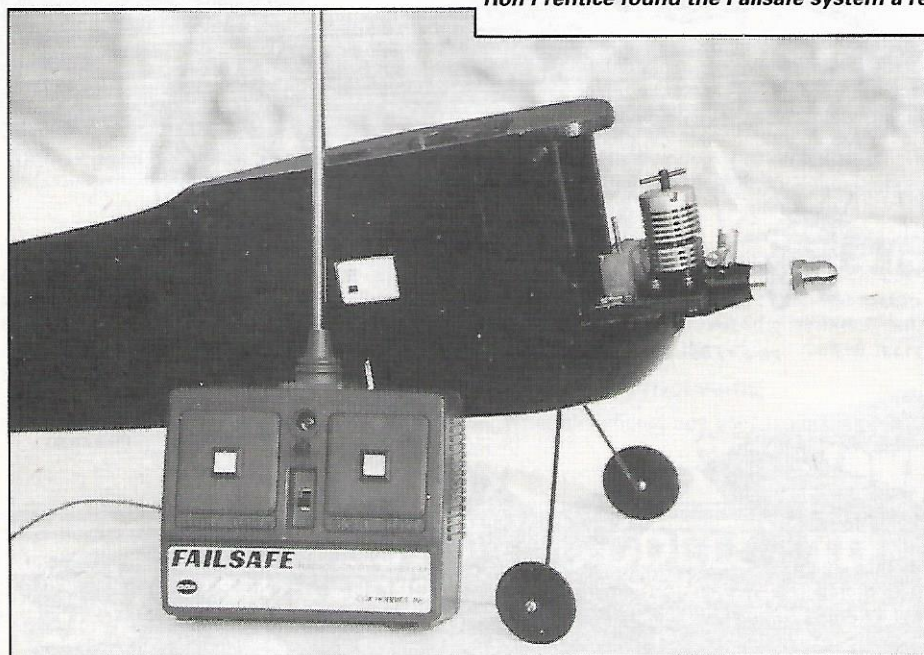
Telephone 0442 876661/4
Between usual office hours.



Ron Prentice and others try out a single channel R/C outfit, ideal for people who do not want to take up R/C!



Ron Prentice found the Failsafe system a real boon in this Halfax.



This picture of Ron's Halfax shows the large hole required to get the standard switch through the side of the fuselage – it could be a problem with some models...

COX FAILSAFE R/C

Several months ago our Editor John Stroud phoned to enquire whether I had ever flown single channel radio. I had to confess that I had back in 1950 with a Mercury Cossor set and again just a few years ago when I flew a Keil Kraft Slicker 50 with a lightweight modern radio, using just one servo operating a rudder trim tab. "Would you mind if I passed your name on to Cox Hobbies in the U.S.A. They are looking for someone in the Vintage scene to try out and report on their new Failsafe single channel radio". How could I resist? A few weeks later it arrived.

The transmitter is small and very light, with two buttons where you would expect the sticks to be. Under the buttons are the words "RIGHT TURN" and "LEFT TURN". Between them is a small knob for proportional trim. Above the Trim control is a red LED to show that it is switched on and below the Trim is the On/Off switch. The transmitter is powered with six penzell batteries, which should operate for between 6 to 8 hours. The airborne receiver pack is a lightweight plastic box which contains the radio and a very small servo. The battery box is separate and designed to take four AAA penzells. The set is on 27 Mhz and has a fixed crystal. Mine is 27.145 Mhz (Yellow) but Brown, Red, Orange, Green and Blue are also available.

The total weight of the receiver pack including batteries is just over three ounces. The batteries should operate for 2 1/2 to 3 hours according to how much the rudder is used. I soon went down to the village post office to buy the required batteries and wasted no time in trying the set out on the bench.

Hold down one of the buttons and the servo moves over to the appropriate side for a second or so, then returns to neutral. To move the servo again it is necessary to release the button and press it again, when it moves over and returns to neutral again.

I was unable to immediately start looking for a suitable aeroplane for it because of my commitments in building the Bazooka stunt control line model and a Wakefield in readiness for my trip to Gorizia in Italy. On my return from the Continent I decided that I was going to build a JUDY, a vintage free flight model designed by J.Coxall back in 1946. This would be the perfect model to try out the new system. However, before I could start building, I attended one of the BMFA Plugge Cup days at Merryfield airfield near my home in Somerset. As well as flying some control line and rubber powered models, I had several flights with a Halfax Rapier power model which I had built several years ago as a prototype for the kits I

produced at that time. Would you believe that out of four flights, two of them ended up in trees! This prompted me to instal the Failsafe system in it as soon as I possibly could, because I am getting to long in the tooth to enjoy climbing trees to recover errant models.

A simple installation

The installation could not have been easier. A 3/32" balsa platform was glued in the fuselage and a small hole for the switch cut in the side. I added an additional cross piece of thin paxolin on to the servo arm to make it double sided and fitted a similar piece of paxolin to the rudder trim tab. The receiver/servo block was fitted on to the mounting platform with double sided servo tape and the servo arm and rudder horn connected with lightweight control line wire. I then added a removable balsa platform above the receiver to take the battery pack and the job was done.

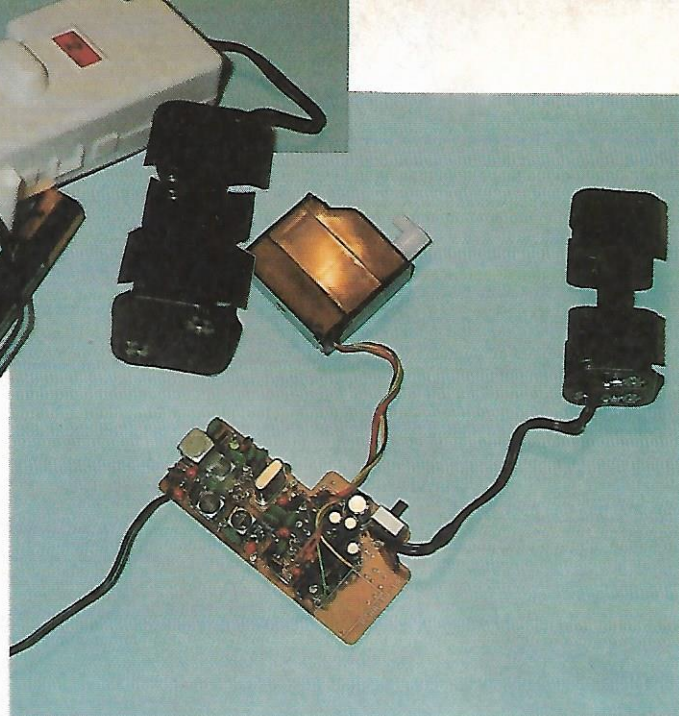
Test flights

At the first opportunity I took the model along to my friendly farmer's field to try it out. The day could not have been better, sunny, mild and with hardly any wind. A couple of hand launches showed that no changes in trim had occurred. The equipment was switched on, the motor started and with the timer set at an 18 second run, the model was launched. As the Rapier was being flown strictly as a free flight model, the transmitter was only operated when necessary to steer it away from trees and into the confines of a medium sized field. No attempt was made to fly it as a "radio model" as such. I am pleased to report that the Failsafe system functioned very well and certainly saved several long walks.

The Cox instruction leaflet gives full instructions on how to eliminate the "auto-return" servo action. As a result of the modification, which consists of soldering a small piece of wire across the leads of a capacitor, the servo will hold its movement until the button is released. This could be very useful for the experienced flier especially in windy conditions.

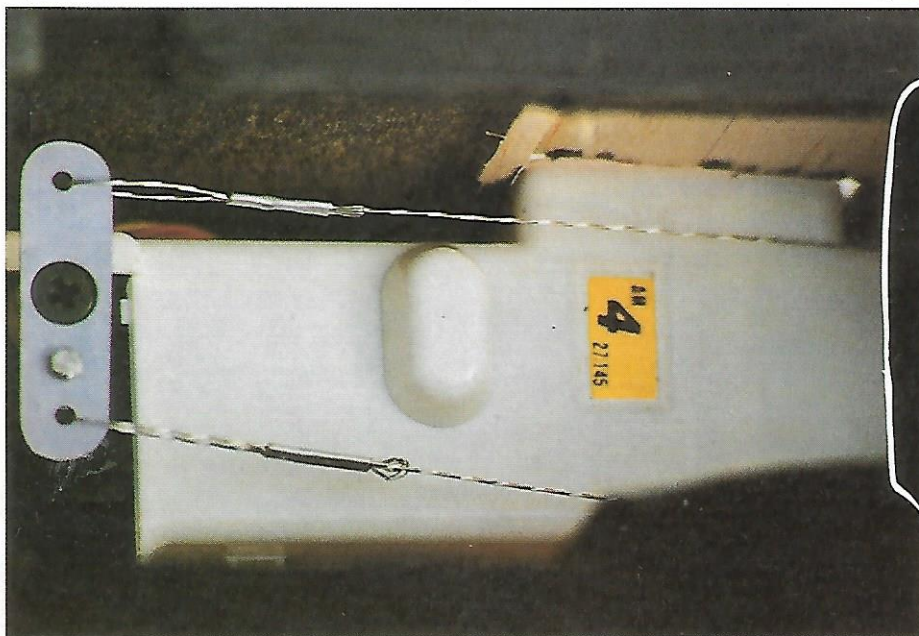
Peter Miller writing in Radio Modeller, August 1992, comes up with the excellent idea of installing the "auto-return" modification with a switch, thus making it possible to use either mode as you choose. Those modellers with a bit more electronic expertise might like to try the modification by Eloy Marez in the January 1993 Model Builder Magazine published in the U.S.A. In his more complicated modification, Mr. Marez not only removes the two pushbuttons and replaces them with one fully proportional stick, but also increases the amount of servo movement by changing one of the resistors.

I recently wrote to John Elliot at Cox Hobbies to enquire whether it would be possible to use



Graham Knight holding Stan Horne's Sharkface – not a good combination with a Failsafe unless you are quick on the buttons!
Right: Chris Coote removed the case to reduce weight and later replaced the standard batteries with much lighter nicads.

Illustration at top centre shows the Rx/servo block as supplied and the Rx battery holder. The Rx switch is on the projection on the far side of the block. System is great fun, especially if you are one of the many who can't take R/C too seriously...



Ron Prentice installed a closed loop system and needed to modify the servo arm. This illustration shows what he did...

The Failsafe transmitter controls are very clear; with some models it will be possible to fly just using the trim knob.

nicads in the Failsafe system. His reply was, "Bear in mind that 6 Alkalines yield 9 volts and 6 nicads only 7.2 volts....Tx power will be down somewhat. I'd be reluctant to recommend it as we haven't tried it. I would suggest several careful range checks, with and without tx antenna to verify range before a flight test. Nicads in the Rx are no problem, as it is voltage compensated... Servo will be a little slower and with a bit less power than with Alkalines but OK." So there you are, I haven't tried nicads yet, but if you decide to have a go, be careful ...

Cox equipment is distributed in the U.K. by Amerang, so I telephoned them to enquire whether Failsafe is available here yet. Mr. Lake, their spokesman, said that due to the present exchange rate situation they had no plans to import it at the moment. He suggested that any modellers wishing to buy one should write direct to Cox Hobbies, Inc. 350 West Rincon Street, Corona, CA 91720-2004, U.S.A.

Telephone (714) 278-1282 or Fax (714) 278-2981.

Editors note

Some other people have been trying a Failsafe too. Chris Coote has one in an electric model, of course. He has stripped it out of the case and uses 110mah cells in the Rx from a dismantled PP9 rechargeable nicad battery. He doesn't say how much weight was saved but I would think it would be about an ounce. Flights with a Sport Wagon in a small R/C field showed how easy it is to operate. No problems using a nicad Rx pack.

On the other hand Stan Horne put a failsafe into a Sharkface (APS Free Plan) for us and it proved rather a handful. Sharkface is from the era of fast flying little single channel models which the experts could fling about the sky in an amazing manner. Stan tells us he has never flown S/C before and full rudder resulted in a spin in in either direction. A much reduced

throw improved the situation but it was not felt to be a good combination for the lost art of button pushing. The shortfalls this unhappy combination uncovered were – As supplied it is impossible to mount the Rx in a sorbo cushion as it is in a block with the servo which must be firmly mounted. The plastic case is light but also fragile and can be damaged in a crash, especially in a fast flying model. Finally the switch, which is also in the block, limits where the Rx/servo block can be mounted and needs a rather large hole in the side of the fuselage.

At the time of going to press I am putting my Failsafe into a Ben Buckle Taylorcraft. The modification to switch the failsafe mode in and out (as per Peter Miller) has been easily carried out and I have put an extra switch in the battery lead to make mounting the Rx/servo easier. With a PAW 1.49 PB up front it should be relaxing to fly this 48" span model. It is just about finished and I will report on how it goes.