

A Citizen-Ship C Proportional 3 + 1 Conversion

Another R.C.M. & E.
How-To Feature

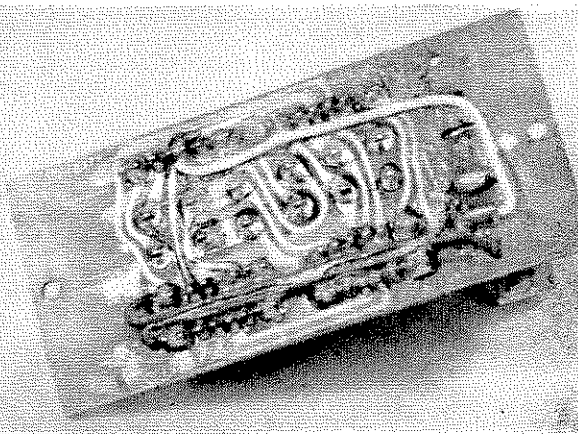
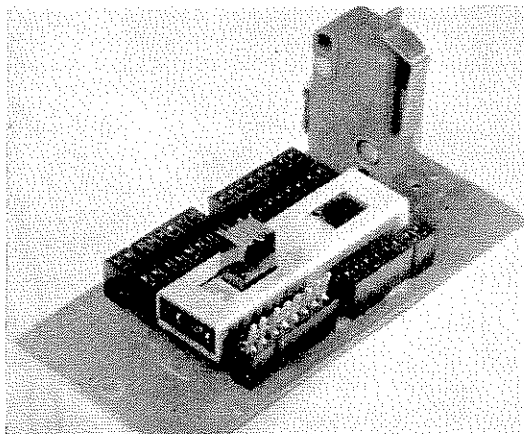
PRICED, for sale in Great Britain at £125, *Citizen-Ship's A. P. C.* proportional control system offers the non-contest modeller proportional control of elevator and rudder, or aileron commands, plus positionable throttle control. As supplied, with plug junction block, it is also possible to operate two servos simultaneously off the directional output to provide coupled rudder and aileron control (C.A.R.), provided the operator first solders in an extra 8 pin *Deans* connector through holes already drilled.

Coupled aileron and rudder control is very useful, but the presence of rudder throw simultaneously with aileron can result in some awkward looking manoeuvres with an aerobatic model, and can produce a rather awkward looking yaw during a roll. Since rudder control is only required for steering on take-off and during taxi-ing, during spins and stall turns, it is very much a "dead" control. The ideal is to be able to eliminate the rudder control except for these

four manoeuvres and the solution lies in what is known as the *3+1 control system*, which goes at least some of the way to lifting a three function sport control system into the "full-house" control bracket.

This end is achieved by means of a tricky, but nevertheless simple piece of circuit re-working which the operator can do for himself, so that rudder control is available simultaneously with aileron from low motor through to just slightly below full throttle position. Due to the non-linearity of most throttle controls, this slight backing-off of the throttle produces no effect on engine speed. Steering is then

Heading: installation details showing Citizen-Ship A.P.C. system in Tauri trainer. Note microswitch on plug board. Bottom left: close-up of plug board showing microswitch in position. Below: P.C. side of plug board showing white wire soldered to battery centre tap at top and blue wire soldered to separated lands bottom left.



available for take-off, after which the throttle is advanced through the last increment, activating a micro-switch in a circuit to switch the rudder servo back to inactive neutral position, leaving aileron control to operate independently with elevator control for normal flying.

Fig. 1 is a diagrammatic illustration of how the cut-out system is wired, showing the micro-switch change-over contacts, servo wires involved in the switchery and the individual P.C. land on the junction board affected. Fig. 2 shows the mounting of the micro-switch on the P.C. board. This should be positioned as shown in Fig. 3, through slots made by drilling lines of holes which can then be elongated to form the slots required. Araldite the micro-switch in place and then turn to the wiring alterations shown in Fig. 3. First break the P.C. land as shown at lower left. When the land has been separated, solder a blue wire to either half. The blue wire to the upper half of this land is then soldered to the N.C. (normally closed) contact tag of the micro-switch. The blue wire from the lower half of the land is passed through a hole drilled in the P.C. board and soldered to the armature tag as shown in Fig. 2.

Still on the P.C. side of the board, turn to the row of soldered pins from the battery socket at top left. As with the other sockets soldered to a single land, the inside left pin has a land of its own. The two centre pins are common to one centre land, while inside right has a separate land and the outside right two pins are again ganged to a single land. Solder a white wire to the centre two pins, and the other end to the N.O. (normally open) contact as shown and then lock all loose wires in position with contact adhesive.

To put the 3+1 arrangement into operation now, all that is required is to install the complete Citizenship proportional system with four servos appropriately into the model and install a trip cam (Fig. 2) onto the throttle push-rod as shown. Arrange the trip cam to throw the micro-switch armature just below full throttle, so that it allows coupled aileron and rudder operation from low speed up to just below full throttle, while at full throttle referencing the rudder servo back to neutral via the battery centre tap. If the operation is reversed, with independent aileron operation at low speed throttle, then you have cross connected the N.O. and N.C. contacts.

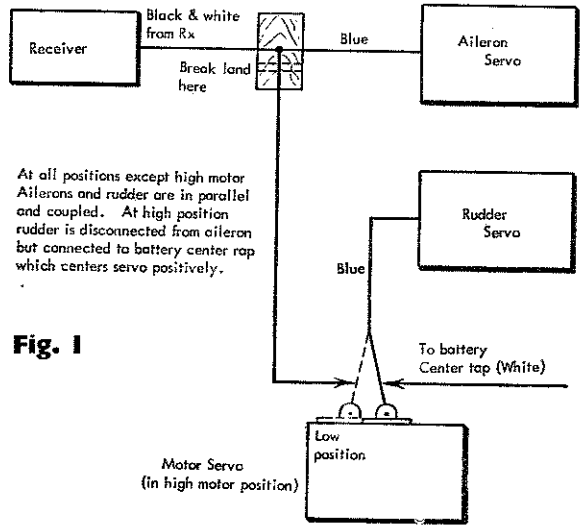


Fig. 1

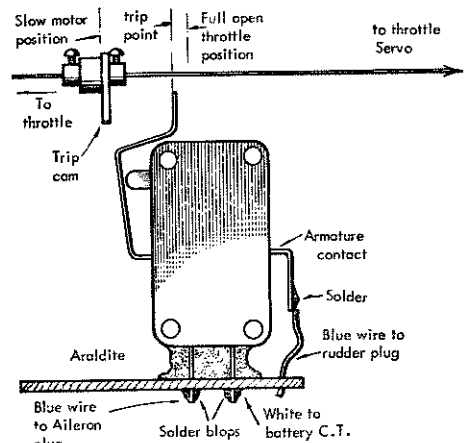


Fig. 2

Fig. 3

