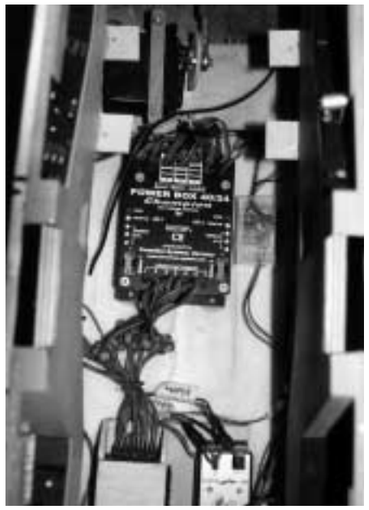
PowerBox 40/24 »Champion«

Emmerich Deutsch produces proven and very popular power supply systems, and the new »Champion« represents the crowning glory of the range. Actually the term »power supply« is no longer adequate for this multi-talented unit. Externally the Champion differs from its predecessor - the ever popular »Competition« - by the provision of the specially marked inputs 3 to 5 or A to C; these are the »Servo Match Control« channels.

In terms of power supply the PowerBox provides dual stabilised voltages of 5.9 Volts. The voltage is monitored by two rows of LEDs and individual external LEDs, with a minimum voltage memory for each battery. All seven channels which are remote from the receiver are equipped with short-circuit protected signal amplifiers, providing an independently stabilised servo signal to each of the 24 servo sockets.

The PowerBox Champion installed in an L-39. Above the PowerBox can be seen the airbrake servo, to its right the switch for the landing lights (Conrad); at bottom left is the receiver, to its right the JetTronics door sequencer. The free cable without a plug belongs to the ECU power supply, which had not been connected when this picture was taken.



The Sensor Switch turns the two batteries on separately, and is also used to read out the minimum voltage memory. After the flight, the operator presses the two power-on buttons simultaneously, and the minimum voltage of each battery is then displayed on the two rows of LEDs on the backer.

For a full description of the power supply characteristics of the PowerBox please read the article written by Dieter Perkuhn in our sister magazine »Modellflug International«, issues 3/2004 and 4/2004.

However, the Champion is also supplied with a separate Adjustor Board fitted with a cable about 100 cm long. The Adjustor Board is designed to be connected to the PowerBox, and provides the means of programming the 12 servos which can be connected to inputs 3 to 5 (or A to C). This facility has previously only been available with the Graupner MagicBox, but is now integrated into the power supply system.

Before we go into these functions in greater detail there is a question to be addressed: »why provide this facility on only three inputs?«. Well, there are certainly reasons of cost behind this; after all, the device has to compete on level terms in the marketplace. On the other hand however, it turns out that it is extremely rare for a model to have more than three functions which operate multiple servos in parallel; this has been established by talking to experts in all disciplines - from TOC pilots to the jet scene. For example, typical applications in model jets are the elevator function (one servo per control surface), landing flaps (ditto) or servo-operated wheel well doors.

Since the PowerBox can be used in conjunction with any radio control system, the first step has to be to initialise the three channels. This is done by selecting channels A to C individually, and then storing the neutral position and the two end-points by pressing the (+) button. It is vital not to neglect this procedure, otherwise subsequent adjustments for the individual servos will not work correctly. My tip: if the servos do not work as you expect when you check the system, re-initialise the channel concerned. When this initial set-up process is concluded, you must then store the settings permanently by selecting the switch position »Save« and pressing the (+) button. Once again, be careful not to overlook this step. If you make a mistake in the set-up procedure and are not sure what is happening, select the switch position »Reset«, and press the (+) and (-) buttons simultaneously to reset the system to the factory defaults.

The upper rotary switch is used to select the channel, while the lower rotary switch selects the servo (1 to 4) for that channel, working from the inside out. Once a servo has been selected, its centre position, end-points and direction of rotation can be adjusted using the (+) and (-) buttons. Coarse adjustment is made by holding the appropriate button pressed in; fine adjustment by pressing the buttons briefly.

At the end of the procedure, the settings can be saved permanently using the switch position »Save«. It is important to take into account the maximum possible angular travel of each servo type when setting the end-points, otherwise there is a danger that the pot and gearbox will strike their end-stops.

Once you have completed all the adjustments, simply disconnect the Adjustor Board from the PowerBox and store it in your pit-box for emergency adjustments. Differential rates of wear in the servo gears, pot or motor can certainly make it necessary to re-adjust the servo settings in the course of a flying season, although we would strongly recommend that such adjustments should always be made at home in peace wherever possible.

Since the outputs of the PowerBox can be assigned to the receiver channels in any order you like, it is possible to assign the Servo Match Control facility to any receiver channel. It is also possible under certain circumstances to avoid the use of extra receiver channels and mixers by clever distribution of the channels. For instance, I have used the Servo Match Control in my L-39 to fine-tune the two elevator servos and the two landing flap servos. At the same time it was possible to reverse the direction of rotation of one elevator servo and thereby avoid linkages of different lengths. I also set up the function of the three-position switch as follows: the switch operates the landing flaps, the speed-brakes and the landing light, and the functions are now superimposed by the PowerBox instead of a mixer: position 1: everything retracted, landing light off; position 2: landing flaps at take-off position, landing light off; position 3: landing flaps at landing position, speedbrakes extended, landing light on. This arrangement avoids the use of a mixer, and also frees up one receiver channel.

Here is a typical application: the elevators of the L-39 are actuated by two servos installed identically, using pushrods of the same length. If the servos are connected conventionally to the PowerBox inputs, one elevator deflects up and the other down. We reversed the direction of rotation of one servo as described, and this immediately solved the problem.

I am quite sure that these example have only skimmed the surface of the possible applications for the PowerBox Champion. If any reader comes across further useful examples, let us have 'em – the JetPower community will be gra teful to you!

Winfried Ohlgart