PowerBox Gemini

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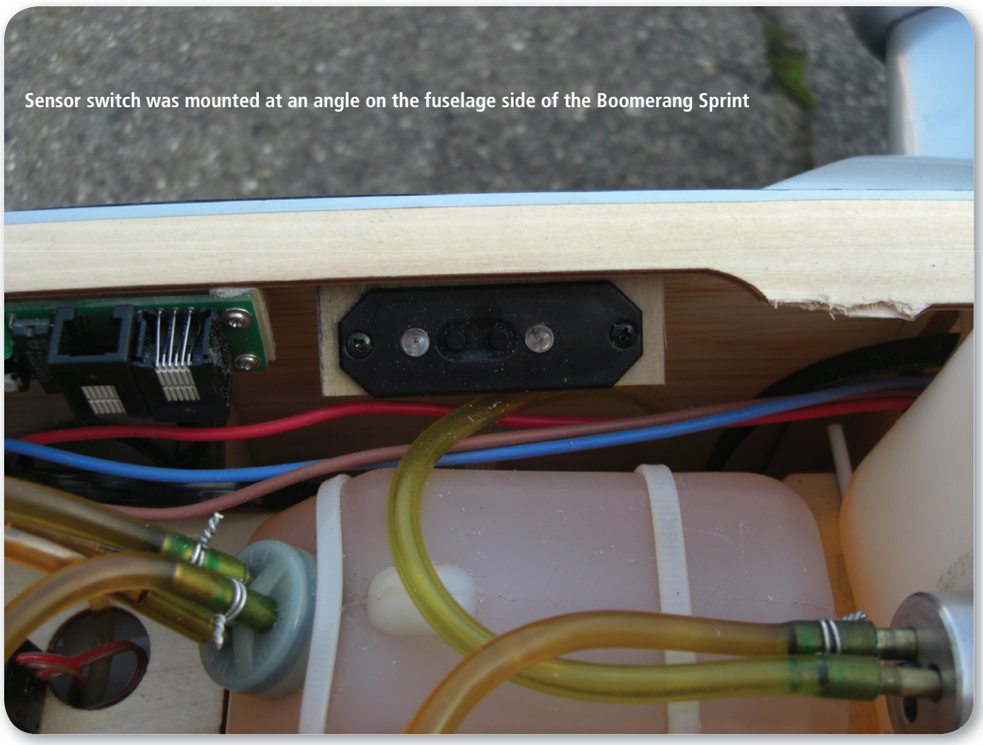
Colin reviews the PowerBox Gemini



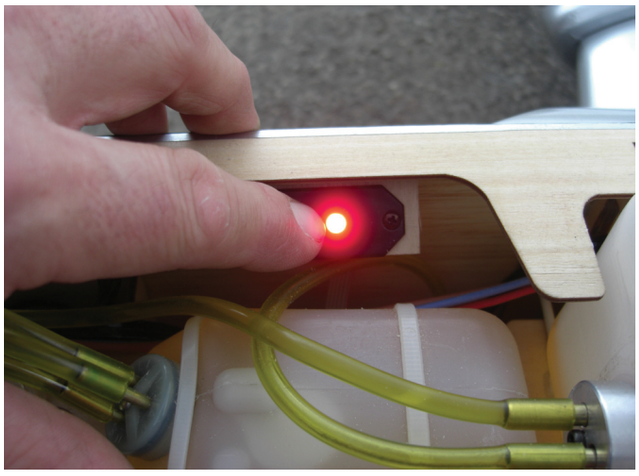
Sensor switch was mounted at an angle on the fuselage side of the Boomerang Sprint

Having now built a number of jets with twin batteries I am sold on this system for any model that can carry the weight of the extra pack and backer, given the significant increase in safety brought about by having a totally reliable power supply on board the aircraft. With my latest build being the Boomerang Sprint fitted with a JetCat P60, I wanted to keep any weight increase to a minimum, so decided to fit a PowerBox Gemini system, having been delighted with all the PowerBox products I have used up to now.

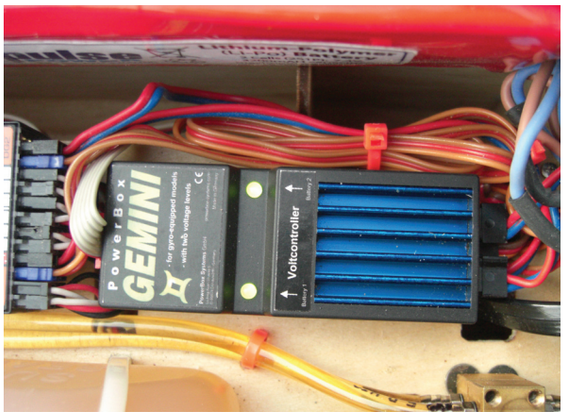
As all the Futaba receivers and servos I use are compatible with up to 6.0 volts the PowerBox Gemini was selected as it is ideal in that it is a fairly compact, lightweight unit, only 44 grams complete, that has a main regulated output of 5.9 volts, the secondary output being 5.4 volts. This secondary output is primarily intended for helicopter gyro use, many of which cannot accept a 6.0 volt input, so for jets without gyros can safely be ignored. Batteries used in conjunction with the Gemini can be either NiCad/NiMH type or LiPo, and the unit is switched between types by the user. Although the Sprint was unlikely to require it, the maximum current capacity of the Gemini is 8.0 amps, so it is suitable to use in models ranging from relatively small to quite large.

In the case of the Sprint I decided to use twin 1500 mAh PowerBox LiPo battery packs, which are supplied complete with neat mounting frames, although due to space constraints I was unable to use these in the end. In the same manner as the larger LiPo packs I fitted into my Phantom, the 1500 mAh packs themselves contain the charging circuitry, which includes a specially developed I/C as well as an SMT temperature sensor, making the use of a dedicated LiPo charger unnecessary. Simple power supply adapters are available for both AC 220/240 volt and DC 12 volt use, allowing easy charging both at home and at the flying field. These adapters have twin leads to enable both packs to be

Sensor switch LED illuminates during switch on procedure



Twin 1500 mAh PowerBox LiPo batteries were installed, giving plenty of capacity for mid to large sized models



Both circuits showing green on the Gemini, the model is powered up and ready to go

The LED for Battery 1 is out showing that either this circuit is switched off, or that there has been a complete failure of the battery or wiring

charged simultaneously, and the battery packs are fitted with red and green LEDs, the red one illuminating whilst charging, the green one signifying the battery is fully charged.

To ensure that the battery packs do not discharge to a level that may cause internal damage during long storage periods, a separate LED on a lead is supplied which can be plugged into the battery. This will illuminate when the packs drops to the equivalent of 3.5 volts per cell. This comes into its own for those of us living in more northerly countries, where it is not so common to fly regularly over the winter months.

In the same manner as the Champion unit I recently reviewed, all of the components required for a reliable power supply system are duplicated, which means that any single failure, whether of a battery or a component within the Gemini, will not result in a loss of power to the radio system, and the failure will be evident as soon as the model lands. Complete redundancy in the power supply system is a huge step forward in flight safety, and should in my view be considered for use in any large/fast/powerful model.

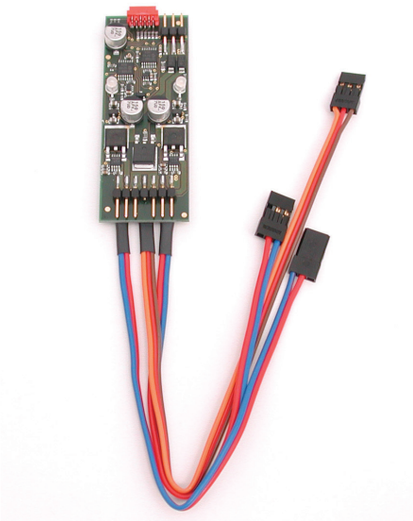
The Gemini package contains the main battery backer itself, as well as the electronic sensor switch, which has a ribbon cable to connect to the backer, this allowing the switch to be remotely mounted for easy access. Acting only as an external control for the electronic switches incorporated within the Gemini, the sensor switch is not an actual radio on/off switch, and should it fail, or become unplugged from the Gemini in use, the system will continue to operate normally. The switch has twin buttons and red LEDs, and power from each battery is switched by holding down the appropriate button for a couple of seconds, whereupon the adjacent LED will illuminate, then releasing the button and immediately pressing briefly again.

At this point one of the LEDs on the Gemini will illuminate, hopefully with a green colour showing the battery is OK. The other colours are orange, red and flashing red, showing the various stages of decline of the battery's voltage, although I, like most pilots, would stop flying as soon as the LED dropped from green. Repeating the operation with the second button will switch the second circuit in, and the unit will then feed the receiver with power from both battery packs.

A secondary low battery warning is given by the red LEDs in the sensor switch – these normally flash once every two seconds, but as the battery gets close to flat, the frequency of the flashing increases.
A useful suggestion in the excellent instruction manual is to stir the sticks before every flight to put the battery packs under load, which will give an early indication of the battery packs becoming flat, or on a new and fully charged system, that the battery packs are unable to provide the current required by the servos.

In this second situation the only remedy would be larger capacity cells, or those with a lower internal resistance. This problem tends to occur mainly with some high capacity AA NiMH cells, which have amazing total capacity, but which can only handle low current drains, with the voltage collapsing as soon as they are under any significant load.

At the end of each flight it is also possible to check on the lowest voltage level that occurred during the flight, as the system records this voltage in its memory, and displays it via the specific colour of the LED when the two buttons are pressed simultaneously. This can give a good indication of the actual in flight situation with the battery packs, and any drop from green should be investigated.



Uncased Gemini unit illustrates the immaculate layout and manufacturing quality typical of PowerBox products

Installation of the Gemini in the Boomerang Sprint was very simple, as the light weight of the unit allows for retention with hook and loop, and the cardboard inner of the box has a cutting guide for the sensor switch. The ribbon cable connecting the Gemini to the switch is over 200 mm long, making it easy to position the two items exactly as required, in this case the switch was mounted at an angle on the fuselage side, making it easily accessible and very visible. The first of the twin leads from the Gemini plugged into the battery socket of the Futaba R6014FS receiver, the second lead plugging into an unused auxiliary channel.

Charging of the twin LiPo packs is extremely simple, and with a total of 3000 mAh available plenty of flying time should be possible. As is expected, the Gemini system has worked perfectly since being installed, and with four very successful flying sessions now completed with the Sprint neither pack has dropped below being in the green at any time. Once again a great product from PowerBox that does exactly what it claims, and I have already obtained a second unit to go into a future model – highly recommended!

www.modellbau-deutsch.com/e/powerbox_systeme/produktuebersicht/start.php

Complete package laid out, which includes an excellent English language manual