

Ghost Rider 38

SHAUN GARRITY BRINGS A GALLOPING GHOST CLASSIC BANG UP TO DATE

Andrew Boddington kindly sent me this image from the family album of dad, David, with the prototype Chostrider 50 and 38.

I mounted the Rx, Tobe Rand (see text) and re-coder on a plate. A method popular back in the olden days.

As a 12-year-old youngster the ability to own proportional radio gear was a pipedream - simple maths, as my income stream from a paper round and pocket money didn't amount to a can of beans. However there was another option available to me by using electronic wizardry and a measure of good old British ingenuity. A system had been developed in the 1950s to give two proportional channels and progressive or selective throttle (depending on the actuator used), and all this from the humble single-channel transmitter modified a little.

The theory of how it works is not easy to simply describe unless you're electronically

mindful, so if you accept it just 'does' then it makes things simple. One characteristic of Galloping Ghost (GG) is the rudder and elevator control surfaces flap furiously all the time and, to the uninitiated, look like a bad case of interference; but it is meant to do this. In the early days of GG you had to make your own rotary actuators from a specific type of geared motor and a lot of accurate wire bending, known as the birdcage, at the tail end so control surfaces would work correctly.

In the January 1968 issue of RCM&E David Boddington published plans for a model called the Ghost Rider 50; he had also designed the Ghost Rider 38 in parallel. The '50 was published first because David had some concerns due to the battery payload GG actuators needed (dual power supplies and heavier actuators etc.), the '38 might end up heavy and in David's words "a vicious little beast".

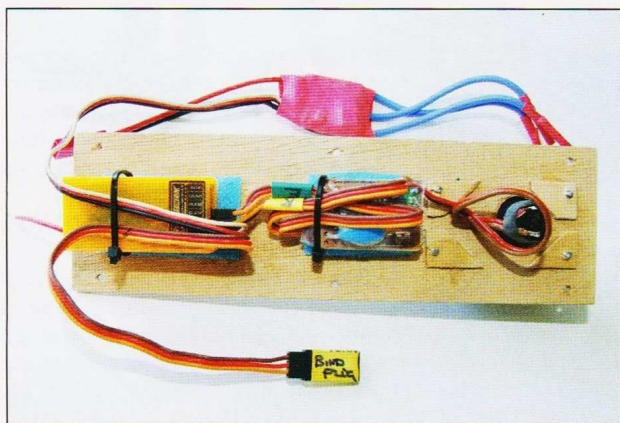
After the initial testing on GG a 2-channel Daveley propo' was installed and it proved that even though the '38 had a tad higher than usual wing loading for its size, other than a faster glide it was a great fun model to fly with no bad manners in either



configuration, hence the reason for its appearance in a later copy of the magazine.

NEW AGE GALLOPING GHOST

The Ghost Rider 38 was the first plane I built and considered to be a proper multi-function aerobatic model. Coming across it when going through my plans prompted me to make one again; the other reason was my mate Phil had developed a Galloping Ghost re-coder that allowed the use of modern 2.4GHz radio with a vintage GG actuator.





As mentioned, you had to build your own actuator in the early days but, as the system gained popularity, a few manufacturers started offering ready-to-go plug and play items. In the popularity stakes Rand LR3 and Ghost actuators were the winners. The Rand was more sophisticated and, by clever design, corrected some of the interaction issues caused by the way the system operated.

One feature of GG was that it had throttle failsafe on loss of signal; pretty unique back in the day, although rarely would it save the model it just meant you crashed slower!

The problem was that we had unintentionally created an issue. Even though Rands etc. were a little thin on the ground they were viewed by many of their owners as 'a bit of old tat' and consequently not worth much. As is usually the case when something appears to be becoming collectable, prices started getting silly and it looked like our new venture was stalling at the first post.

Fortunately I have a modelling friend who lives in Sweden and is also a bit of a wizard with a 3D printer. Tobe, for it was he, developed his version of the Rand using a modern gearbox and motor so, in no time at all, there was a viable alternative without any supply problems. I've noticed the price of old Rands has dropped recently, I wonder why?

FROM A LAND DOWN UNDER

Anyway back to the model, a Ghost Rider 38 with GG? Now that would be a little different down at the flying field. As mentioned David had test flown the prototype with propo' so you don't need to go down the GG control route if you want to build one. I did have another problem though as our 5th annual Single Channel and Retro fly-in was looming earlier in the year and I didn't have much spare time for building. Enter another modelling mate Gary from Australia who kindly offered to make one for me. I decided that the original Blue and White colour scheme wasn't for me so chose the classic Boddington Orange and Blue colours of the larger version. It was an epic packing job and arrived in all its intended pieces with no damage. As you can see from the photos Gary is an excellent builder; he's thinking about coming back to the UK and I have another little project I could send his way, well, not so little, it's a 1/3-scale Bristol M1!

GET BUILDING

When I built the original model in the early '70s, I started with the wings as they are my least favourite part when making a new model. The wing section is symmetrical and quite thick for the model type and size. David explained that the reason behind this was twofold as it helps maintain a constant

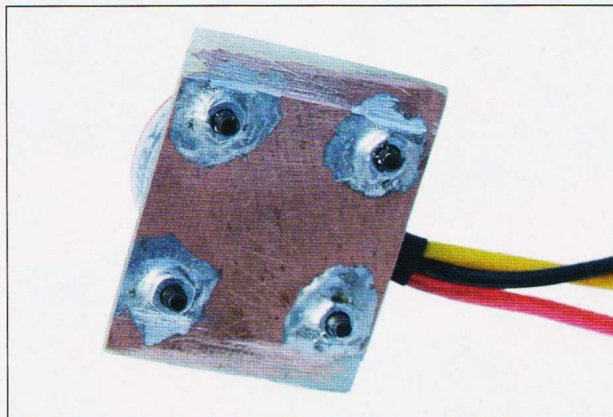
speed throughout the flight envelope (especially in a dive due to the additional drag) and also lowers the stalling speed. It's a little unusual in not having a dihedral brace but the large gluing area of the root rib provides ample strength and has been proved when chucking the model around the sky.

As can be seen from the plan, it features a full depth wing spa, the top and bottom sheeting forms a very strong D box structure. I use the good old sandwich method for making ribs but choose your preferred way as long as they are accurate. The plan shows how you need to block up the leading and trailing edges to ensure accuracy. Use lots of pins, check everything is aligned and don't forget to angle the root rib so you get the correct dihedral angle. Shape the top of the leading edge then glue the top leading and trailing edge sheeting in place. When dry remove each wing panel and then it's the same procedure as for the top, but ensure you don't introduce any warps so keep the wing on a level surface when adding the lower sheeting.

Next comes a simple task - the fin and tail - I would use reasonably hard straight balsa for both. I made a slight change for the elevator as the original specified 1/16" ply with 1/32" stiffeners but just using the same balsa as for the tailplane worked out fine in practice. In use GG models hammer the hinges so they need to be robust but free, so use thin Mylar or traditional

You could just belly land your GR38 although wheels do lend it some character.

It's amazing what you can do with a 3D printer these days!



To enable trim changes I used my go-to method of mounting the motor on PCB.

Soldering the motor nuts to the PCB firewall makes for an easy install.



Gary's Australian built 3-channel model and Glyn's tissue covered version with additional ailerons.

stitching and steer clear of tape or Solarfilm ones.

The fuselage is a little more complex than any of the models revisited to date in this classic plan series but you could modify it if you like and use 1/8" instead of the 3/32" sides and spacers so long as whatever you choose is matched otherwise you could end up with a warped, banana shaped fuselage.

If going electric then forget about the engine bearers but don't omit the doublers as even very soft balsa, vertically grained, adds substantial strength and rigidity. Also, make a battery hatch to save you removing the wings every time you need to change your LiPo.

A feature of many Boddo' models was radio gear that could be easily removed. Back then it was expensive, having servos and an Rx for each model you owned would have been an alien concept even for wealthier modellers. I decided to keep this approach for the Australian Ghost Rider 38 and fitted the Tobe Rand, re-coder and Rx to a removable liteply plate as shown.

The undercarriage is optional but adds to the character of this model, I think it would look odd without. It's easy to form using a wire bender such as my trusty and ancient Model Flight Accessories example but you could more than likely buy some



suitable legs ready formed from your local model shop. If you can only fly from rough grassy fields then the ply underside will provide plenty of protection if you dispense with the wheels.

FINISHING

Not a lot of people realise but Solarfilm type covering was around in the '60s, so it makes a perfectly authentic finish, one that's far easier to achieve than tissue, nylon & dope etc. Remember though it won't hide a poor build so spend some time with the

sandpaper and filler if necessary first.

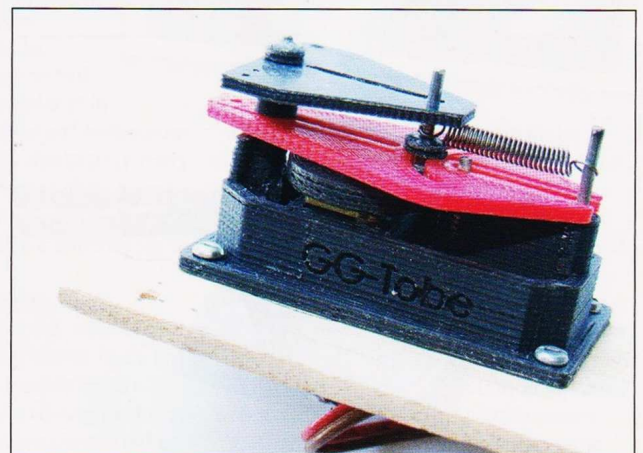
Fuel proof around the nose and tank bay if you are going the i.c. route prior to covering. I recently reviewed a 3D printer and found a file I could download for a Fuji .09 style engine. On printing I was amazed at the level of detail and realised it would be very convincing on a model so knocked a few more out and used one as shown on this Ghost Rider 38. A bit of silver paint and a black Sharpie pen finished it off.

The bulkhead for the electric motor was a piece of printed circuit board with nuts

Propo' and 2.4GHz Galloping Ghost radio set ups in the GR38.



My Swedish mate Tobe makes these 3D printed new age Rand actuators.

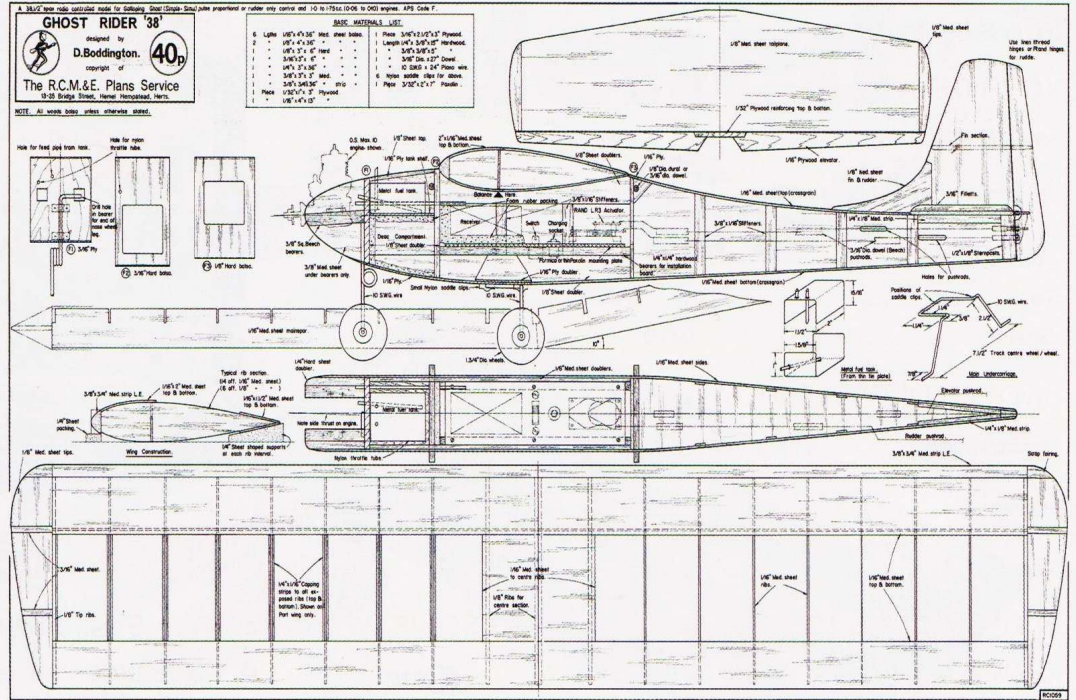


soldered onto the copper side. Mounted as shown it is very easy to remove if required or change the trim of the motor. If you are using propo' you can increase the width of the elevator a little; small elevators were a feature of GG models to help reduce gallop. The rudder has plenty of authority as designed though.

GALLOPING AWAY

This wasn't my first 2.4GHz Galloping Ghost model; last year when Phil developed the prototype re-coder to test it out, I built a Boddo Swift, a free plan from RCM&E that used an injection moulded foam wing (from a series of models David designed that were kitted by Micro Mold). A flying buddy knocked up a foam wing for me as the original moulded ones are no longer made. The Swift had an original Rand in and flew an absolute treat but, importantly, proved the re-coder worked.

If you've built your Ghost Rider 38 accurately and have the C of G as shown then there's no point in test gliding. I put



It's important to have bind free hinges and light but rigid pushrods when using a Galloping Ghost actuator.

A 3D printed motor disguises an electric power plant. I found the file for this at thingiverse.com.

mine on the grass strip, opened the tap and it was heading skyward in short order.

You could instantly tell this was a well-designed GG model as very little wiggle was evident; more of a shimmy. This really did fly straight off the board and was an absolute treat to steer around the sky.

I can't understand why it has taken this long for me to have another one. It's capable of loops, rolls, even inverted flight and glides surprisingly well for a model with a fat wing. I seem to remember that David also suggested it could be flown single-channel by adding a little more dihedral and trimmed to fly fast.

Due to the symmetrical wing section you would need to employ the single-channel technique of blipping the rudder fast right then left then right etc. to get the nose up and make it climb or, alternatively, use an escapement that has a kick-up elevator facility.

Good, that should keep you busy. Next time I'll have something that is very simple to build, cheap as chips and forming the basis for a new rudder-only pylon racing event. What started as a joke has quickly

developed to the point where models are being built around the world with examples from Sweden, Germany, South Africa, Australia, and the UK. Mine was flight ready in a day so there's no excuse not to join in at next year's inaugural race meeting at the 6th Pontefract Single-Channel and Retro event in June. ➔

WANT A RE-CODER?

You'll need a re-coder from Phil and the Rand from Tobe the complete system along with your regular 2.4GHz or 35MHz Tx and Rx, however the Rand will work with an original Galloping Ghost set. The items aren't commercially produced and limited to one per order. Email them in the first instance.

Phil: philg@talk12.com **Tobe:** w4tdk@bellsouth.net



Heat shrink films were available in the '60s, so would be authentic should you use them.