The Airborne Engin-ear

by Brian Winch

RCATS SMART LITHIUM GLOW DRIVER

FEATURES:-
4,800 mAh lithium battery installed.
Built in battery charger.
Adjusts to suit plug requirements
Visual indication of current being drawn.
Ramp up power to light plug.
Over/under charge prevention.
Auto shut off.
Multi voltage power supply.
Dimensions - 125 mm long x 67 mm wide x 20 mm thick

GIVE ME A REASON

Why should you purchase an RCATS Glow Driver?

Is it because you want what is probably the best glow driver available?

You want consistent reliability?

You would feel relieved to know that the chances of going to the field and finding your glow driver had a flat battery is all but eliminated?

You want an indication of when the plug is starting to die?

Okay, that's a sample of the reasons why you should consider this driver to be an addition to your field equipment. Let's do a closer examination and I'll tell you why I had to have one.

GOOD ADVICE

One of my close mates has a mental block when it comes to charging batteries and setting up chargers. He's no dope - in fact he is a very intelligent person. It's just that he slips up somewhere when it comes to charging and checking batteries. For a long time he would have problems starting his engines due to low power supplies in any one of two or three glow drivers he bought with him to the field. Eventually I found he had a dud charger. It indicated all was good but the digits lied. As well, he had a couple of pocket rockets (Nistarters) and the batteries in these were less than healthy. Reading through a US magazine on day I read a report about the RCATS driver. On viewing the web site it looked very good to me. At the time I didn't think I needed one as I had a good on-field driver. Anyway, I showed the report to my mate and he was impressed. Next day he ordered - not one - but TWO RCATS drivers.... just in case the batteries in one went flat. Quick as a blink they arrived in his post box and we gave them a tryout - they came with a full charge! I have to tell you - we were both really impressed. I borrowed one and demonstrated it at several flying fields mainly to see how it stood up to constant and varied use. It never let me down and quite a few modellers were so impressed they bought one for themselves. I was convinced so I made contact with Michael Luvara, the designer and manufacturer and discussed a magazine review. Michael told me the drivers were selling well and he was out of stock at the time. As soon as a new batch was ready he would ship my order of one driver and two boots (more on the boots later). The parcel arrived quick smart and I planned to take it to a popular annual float fly meeting to following week. In between I gave it a lot of use on the bench testing it with different plugs, plugs full of fuel, oil and water, flooded engines, cold plugs in four stroke engines and 'over the hill' plugs with elements long past the use by date. I did not, at that time, charge the batteries - I was using it as supplied. On the following weekend I took it to the float fly and made it available for general use and used it myself of many occasions when my assistance was requested for engine starting problems. It certainly got a lot of use as modellers found out about it being available and wanted to try it out. Two modellers had their own RCATS and told me they had been impressed when they saw me using my mates some time back so they sent off an order the next day.

On the left is the unit as it comes ready for use. In the centre it is fitted in a rubber glove and on the right is an open glove. Gloves come with a foldable rear support and in a range of colours

At the very least my demo' model had been used no less than 100 times on the Saturday. Unfortunately I could not stay for the weekend as I had a load of other things to do including some engine testing and a couple of repairs on the Sunday. I used the RCATS throughout the day on the Sunday and, due to the many uses of it the previous day, it had become just another tool, so to speak, and I had really forgotten I was checking it out for a product test. That night it came back to me that I was supposed to be closely monitoring this item. How many times had it been used so far? Well, I lost count so let's say it had had an incredible amount of use over these two days - probably equivalent to about one year of use for a sport flier type modeller. Okay, let's see what happens during the charging procedure. The test unit was fitted into a protective 'boot' sold as an accessory (highly recommended) and I found there was no hole in the base of the boot for the charge lead. Well, when you consider that you might charge it only once per year, I guess taking the boot off is no great drama. Look on the positive side - the charge socket is well protected inside the boot and there is no chance of a stray item poking into the socket and creating a few sparks. When you switch on the charger a red light comes on in the front panel and switches off automatically when the charge process is complete. After all the use it had been given, the red light went out just a tad over two hours! I carried out a test with a multi meter and the batteries were topped right up to their limit.

WHAT DOES IT DO?

Well, basically, it energises your glow plug which is a fancy way of saying - it heats up the element! Such a simple thing you might say but there is more to cooking the coil than meets the eye.

For the element of a glow plug to have anything like a reasonable life is must start the day, so to speak, as a little glowing ember and blossom into a thick orange flower. A wimpy bit of red somewhere deep in the plug recess is almost useless and a bright orange white glow is tantamount to destruction. A lot of the power

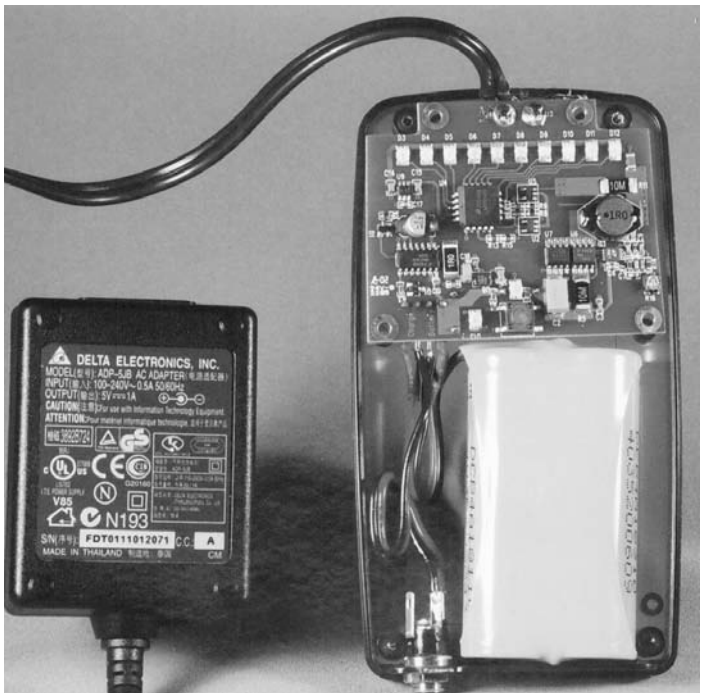
panels are culprits in this crime. Each time you switch on the glow power on many power panels a rush of power is sent to the plug. Depending on the type it can be a direct current or pulsing 12 Volts and many are adjustable by the operator - that's you! For a micro second or two the power is above what is needed and the plug glows almost white hot - not nice! According to some thinking this is to initially clear an oily plug. Maybe so but I tend to go with the information I received from my electronics reference guru. Nothing very sophisticated in the driver of a power panel generally and the power is sent out in a rush or a load until it hits the resistance of the element and stabilises to the preset or adjusted current. Whatever it does, the bright glowing light is not good for a plug and it shortens the life of it considerably. Next choice is a 1.5 or 2 Volt gel or liquid acid battery. The 1.5 V is quite good but the 2 Volt cell needs a resistance in the line or super long leads to cut the voltage down to 1.5 V as is required by the majority of glow plugs. Well, you have to cart the battery around being aware that it is easily shorted out if you are not extra careful or the acid fumes corrodes everything in your carry box and leaves nasty white crystals in every corner. Add to that the connections are always coming apart or turning black. You know I speak the truth - you have seen it or been part of the story... grotty black wires wound around a terminal of a sort and always sparking, coming loose or not carrying the power. Next we have the pocket rocket - a 1.2 Volt Nicad in a canister and a plug connector tube out one end. Yes, not too bad.... when the battery is fully charged and giving out 1.4 Volts. Quite rapidly the battery goes down the slope and you are nearer 1 Volt than 1.4. The glow plug is a faint orange colour or simply black hot and you wonder why the engine is hard to start!

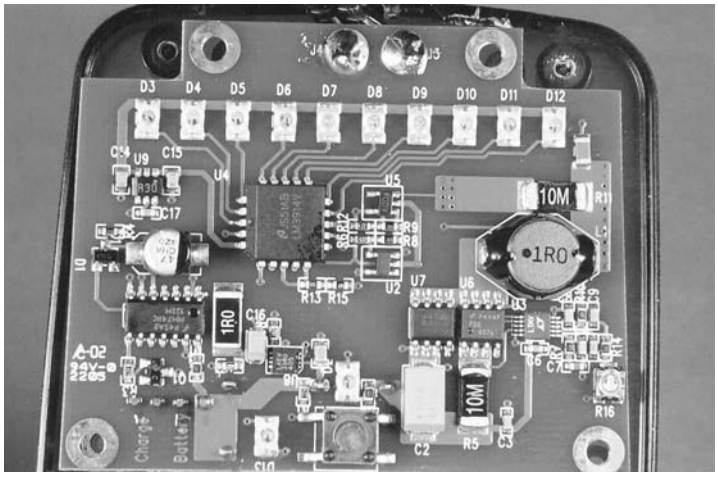
Many times I see modellers at flying fields with a power panel (plus a 12V battery) and two or more pocket boosters. Is that telling you something? The odd thing is that these are the modellers who generally have to borrow a glow driver due to all their batteries being flat or 'something' not working. 'The batteries were okay last week so they should still be okay'. Err.. hold the phone there mate...lead acid, nickel metal hydride and nickel cadmium batteries start going flat the second you remove them from the charger. Not only that, cold weather exacerbates this 'natural discharge' which is why you might have to start a BBQ under your old FJ when the weather turns cold in order to warm up the battery. One battery that is not subject to cold and does not need temperature compensation in the charging process is the lithium-ion. Let us now look at the alternative to the sometimes dodgy glow driving.

THE GOOD BIT

The RCATS driver has a 4,800 mAh power supply consisting of two lithium-ion cells. The final output to the glow plug can be as high as 5 Amps if ever required. Due to the type and capacity of the battery pack, an average sport type flier would need to re-charge the batteries about every 18 months. A more intent flier might need to consider an annual charge. After, say, 18 months you decide to bring the batteries up to full capacity... where did you put that blasted charger? Not a worry old chap - it's built into the unit. All you need is the multi voltage AC adaptor that came with your driver to plug into a wall socket. About 8 hours for a full charge and the process is indicated by a red light in the front panel of the driver. Built in safety circuitry prevents under or over charging and full charge cut-off is totally automatic. Okay.. that's the charging bit out of the way. Wait a bit, somebody in the rear of the class just asked about the 18 months battery life and what happens if you forget to turn the driver off and it drains the battery. Well, without a plug connected the power drain is limited to one small LED (Light Emission Diode) and that would be infinitesimal. However, you can't leave the power on as there is a built in (average) 90 second timer. You press the 'ON' button, another red light illuminates and your driver is ready for action. After the 90 or so seconds (my one is 85 seconds) has gone the driver switches off automatically. If you are having a problem starting and want more glow time, press the button while the driver is active - red light on - and it will go into another 90 seconds cycle and on infinitum.

Now we come to a bit that really appeals to me. When you make the connection to the plug and switch on the power there is no sudden burst of colour - no pyrotechnic display, no white hot metal... the plug element SLOWLY comes on and continues until it is the correct colour for that plug. The driver reads the resistance of the wire and the current supplied is only that which is needed. No warm glow for one plug - white hot for another type - all plugs glow correctly. If the plug is wet with fuel or oil the current adjusts for this until all is back to normal again. At this time there will be a number of LED's glowing in the top of the panel indicating the current being drawn by that plug. An astute modeller would keep a simple record of the current draw on a brand new plug as a method of predicting





Left: If you're interested in the electric system, the power adaptor on the left drives the built in charger via the base socket and the charger tops up the battery in lower section of the case.

Above: Now we're getting into the technical stuff - all the Surface Mount componentry. The blocks across the top numbered D3 to D12 are LED's that light up to indicate the current draw of the plug.

its useful life. If a plug begins to draw more current for no other reason, it is an indication that all is not well - the element is on the way downhill. Change it now rather than battle a 'dead stick' at the worst possible moment.

Just a thought here if you want to see what goes on in a flooded engine - connect the clip to a good plug, immerse the plug in water and switch on. I certainly don't recommend this but... you could probably heat up a cup of water enough for a cup of coffee if you've nothing better to do with your time.

LANDING LEG

Well, there you have it. A super reliable glow driver that will give, probably, thousands of hours of reliable service and all you need do is give the charge a bit of a tickle up at a rare moment. You have the option of several glow clips and (highly recommended) the protective rubber glove. Go for it!

A couple of years back there was an advert on the telly about a bloke who liked his electric razor so much he bought the company. He had an American accent so the ad' might have come from USA - the same place of manufacture for the driver. Well, I didn't buy the company but I did buy the second one my mate had so I now have one in my field box and one in my test shop. Also, I can use both to start up any twin cylinder engines I test or repair.

The manufacturer said he would hold the prices for the moment (component costs have risen) for modellers who read the review so tell him who told you about it.

Grab yours now from: RCAT SYSTEMS.
1812 Ashbury St.,
San Jose, Ca 95126.
Phone/fax 408.292.9794
email: info@rcatsystems.com
Web: www.rcatsystems.com

Price at time of writing this review - January 2006: Glow driver - US$99.95. Coloured glove - US$9.95.