



Protocab

UPDATE

THE NEWSLETTER OF CLUB PROTOCAB MANAGED BY ACC+ESS LIMITED- MANUFACTURERS OF THE PROTOCAB WIRELESS MODEL RAILWAY CONTROL SYSTEM

PROGRESS REPORT

We're bringing you this update in advance of the next Newsletter to let you know how we are progressing. First of all, we are sorry for being quiet for the last few months and thank you to Club members who have enquired about how we are getting on. We have, in fact, been very busy indeed

with developments. We had forecast that we would be ready for the beta test at the end of May/early June but we have been delayed by factors described in this update. However, we are pleased to report that we are making rapid progress.

VERSION REDESIGNS

Every electronic printed circuit board (PCB) design has to be carefully planned and implemented. The major consideration is the reduction of Electro-Magnetic Interference (EMI) - the reason that your locos have a 'suppressor' (capacitor) across the motor terminals. All electronics assemblies, particularly those with radio frequency components, are subject to rigorous regulations both within the European Union (to obtain the 'CE' mark) and the Americas (the FCC govern the use of radio transmitting equipment) and EMI features very highly in these regulations. But making sure that the emissions from the *intentional* radio transmitters on the Protocab circuits comply with the regulations is one thing. All electronic circuits have the potential to act as *unintentional* radio frequency transmitters. To overcome this, the placing of

components and, most importantly, the tracks of copper that run between them, have to be very carefully planned and tested.

In deciding to replace some of the sub-assemblies as described in the article on the right, we had to start over and redesign and test the layout of the printed circuit boards again. We are now coming to the end of this process and will be testing the new boards in the next week or so.

Subject to the successful outcome of EMI testing of these boards, we are now happy with both the designs and the components used in the designs and the supply of all components is good.

(postscript: it is good practice to have an effective version control system to be able to roll back a design if required and we use an industry standard system that provides comprehensive version control operated and updated by each of the developers.)

YOUR OFFERS APPRECIATED!

To Club members who have offered professional and financial support, we are so very grateful and please do not think us too rude that we have not been back to you sooner to take up your kind offers.

However, we want to be advanced to the stage when the Protocab project can best benefit from your support and this is not very far off now, so we hope your offers are still open!

IMPORTANT NOTICE!

Although we have changed the design of the Concentrator and LCU boards as described alongside, we have **not** changed the sizes of the boards. This will be important for the several modellers we know who are building locomotives to fit Protocab components to the previously published dimensions.

Component supply

We are building Protocab from scratch from the ground up rather than using off-the-shelf components which were designed for other applications. The main reason for this approach is that it gives us complete control over every aspect of the design which is important not just for the Pilot Series but for the continuity of design as we introduce new features along the way. For instance, we can select the smallest possible components to fit in the largest range of locos - witness our choice of connectors which have been sourced with the idea of fitting inside very small 4mm scale tank locos as well as larger locos (i.e. the connectors can sustain high currents). Along the way, we have also found better ways to implement circuits with different components to improve efficiency, function and reliability. The system that you might have seen demonstrated in 2012 bears little resemblance to the Pilot Series soon to be available.

However, to simplify development, particularly where the regulatory process has already been undertaken by the designers, we have used a number of pre-configured sub-assemblies. We have been concerned for a few months about the availability of two of these sub-assemblies and we do not want to be in the position of being unable to fulfil demand because of the extended leadtimes from these suppliers. We have now received notification from one of the suppliers that they are facing difficulty of supply themselves and this has justified our decision to replace these sub-assemblies with our own design. This has meant a major redesign of the layouts of the Concentrator and LCU PCBs. It also means that the programs that drive these components has had to be redesigned, which we had not forecast.

Our policy is to source components from at least three suppliers and to identify and specifically manage any component that is not available from more than two suppliers. We generally manage to obtain components overnight so, for the majority of components, lead times should not be an issue.

TESTING CONTINUES

Although we have changed the design as outlined above, this has not stopped us testing the system. We have carried out our own tests extensively on a range of locomotives. As a result, we have gained significant user experience which has influenced latest designs particularly of the user interface

(i.e. the controller). In the last few weeks, we extended our test team to include wives, girlfriends and pals, all of whom had no previous experience of running model railways and gave us essential 'ergonomic' data on the usability of the system. We will describe one development arising out of this study in our next Newsletter.

We have been delighted to attend exhibitions and to take up kind invitations from a number of model railway clubs to present to their meetings. These are a great source of feedback for us. Our next show is at ExpoEM North in Manchester on September 13/14 and then Scaleforum in Aylesbury a fortnight later.



We're still taking the odd hour off to develop the 75A Brighton layout and here is a photo of progress so far. All the trackwork on board 1 (of 9!) is complete and this is the board with the majority of pointwork so, it can be argued, the time-consuming part of building the trackwork is over. The two bare boards in the distance contain the running sheds and sidings and there are only one switch and

five crossing on these two boards. We are hoping for 75A to be ready for ExpoEM North in 2015 but, as you can see, there is some way to go! At least there is no need for any grass laying!

We happen to know of at least three layouts that are being built with Protocab in mind, all of which will be ready long before Brighton!

Photo by Tony Hagon

Several Club Protocab members have commented to us and in social media sites about the need for standards, and the Acc+Ess standard for Protocab is now well advanced. We are very pleased with the way that the data protocols work and the flexibility they give for all sorts of future developments.

So where are we now and how long will it still take?

By the end of September, we should be where we intended to be at the end of May, assuming no further unplanned delays. We have to complete tests on the final revisions of the Concentrator and LCU hardware, we forecast about three weeks for this. The firmware to drive these units is well advanced and needs around two more weeks. The control app is almost complete. Once we have finalised hardware tests and carried out final EMC (that's Electro-Magnetic Compatibility) testing, we can confirm prices with our suppliers.

We have had to hold up the design of the Concentrator housing until the final layout of the components on the

printed circuit board has been completed, but now that is done we can finish the design of the housing and hope to get a prototype for display at Scaleforum.

We expect to be able to carry out the beta test while we await delivery of production components, so realistically, we would hope first production items to be available by the middle of Autumn.

We're aware that we have made predictions before which we have not been able to meet and apologise not to have been more accurate on our forecasts. But we are very grateful that so many modellers have supported our efforts. We're really keen to reward that support as soon as possible.

We will send the next Newsletter in the coming weeks, and hopefully before ExpoEM North depending on how far we get with our testing. You'll see why we're holding it back when you receive it!

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