Restoring an Eddystone EC10 receiver when the glass scale is unusable

It is an unfortunate fact that as time progresses it becomes harder to maintain old equipment in its original form. The EC10 is a case in point. It is a nice little quality set with character. Unfortunately, the original scale is painted in white on the rear of the glass, and the reading is taken by a white pointer against the dark grey background. If you decided to restore such a set, you are likely to attempt to clean the scale. But be careful, however delicately you proceed, you may find as I did, that the paint comes off the scale. Replacements are not available – so what do you do?

Replacing the scale

This is what I did, in the process changing the scale colour from white on grey to black on white. This is necessary because it is difficult to make a quality white on grey scale using the proposed method. However, the new scale is quite attractive as can be seen in the picture of the finished job – and should replacement original glass scales become available, it would be an easy matter to restore the original colour scheme.

The work is easy to do and comprises six steps:

Illustration 1: The finished receiver

1 Dismantle the receiver to extract the scale plate.
2 Paint the plate white to form a background to the new scale.
3 Create a new scale by printing the pattern onto a transfer sheet (also known as Waterslide Decal Paper)
4 Trim the decal to fit the scale, soak it in water, and then apply the transfer
5 Paint the pointer black
6 Clean the remaining paint off the original glass and reassemble

There are a few pitfalls so here are some notes and illustrations to help:

Painting the scale plate

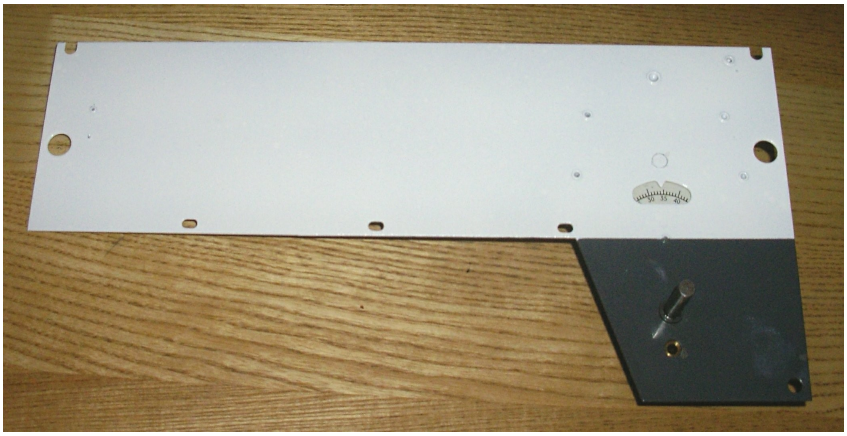
Illustration 2: The scale plate after painting

This is straightforward once the plate is disassembled (instructions for that process can be found elsewhere on the EUG website so are not repeated here). The area to be painted should be cleaned and slightly roughened with wire wool, and then carefully masked. A piece of cardboard should be inserted between the plate and the dial indicator scale to protect the scale, which will not be painted. A fine spray carefully applied is

recommended. Note that the rivet holes etc. will be visible through the transfer in the result, as they were originally. I felt this was acceptable. You might want to insert an additional plate to carry the scale and hide the holes. However, if you do you will have two problems – the dial indicator scale will need to be visible through a hole that you will have to make, and the scale may foul the pointer. There is not much room in this very compact panel design. I decided not to attempt to insert an additional plate.

You should note that the end of a spindle penetrates the plate just above the dial indicator scale. You do not want the transfer to adhere to this spindle, as if it does the scale markings will be damaged when it rotates. I found that the best way to prevent this was to keep adjusting the spindle whilst the transfer was drying to break the glue bond. This is a tricky operation, but it worked for me!

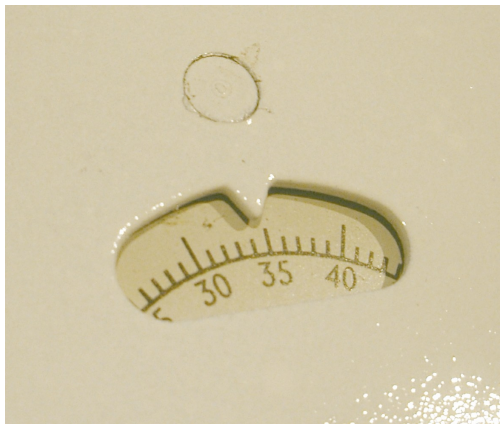

Illustration 3: The spindle to which the decal should not bond

Making the transfer

I made the pattern for the new scale using a scan of the old glass pattern as a base layer, and then, with Powerpoint, built the image of the scale to match. Once completed, the original scan was removed, leaving the pattern of the finished scale. I can provide my .ppt file as artwork for anyone wanting to try this (Office 97 or .jpg format), but you may be able to make a better job of it than I did. I expect there are better tools then Powerpoint, but after years working in a major global corporation my Powerpoint skills are not bad whereas I am unfamiliar with real graphic tools such as The Gimp. You may have other skills you can use. You then need to make a number of prints, adjusting the scaling to get the printed size exactly right. If you don't you won't be able to trim the tuned circuits to the new scale. The transfer is made by printing, using a normal inkjet printer, onto Waterslide Decal Paper (bought in a pack of 10 sheets of A4 size on the internet – a search will find some). My artwork prints two copies on one sheet of A4.

Trim to size and apply

Be careful to trim so that the pointer slide will just clear the top edge of the transfer to avoid scuffing and binding, and the bottom edge is just below the line of sight. Don't trim the dial indicator hole until the transfer is dry and then use a very sharp blade. You will need to temporarily release the cord tensioning spring as that protrudes through a hole in the panel and would stop you applying the transfer accurately. Refit it once the transfer is quite dry. Positioning the transfer is the most critical task.

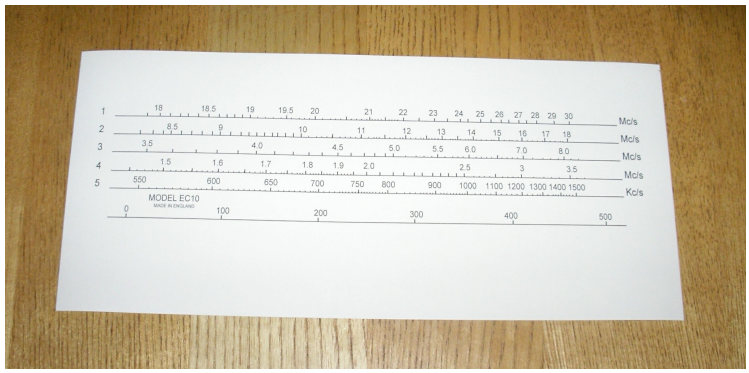

Illustration 4: The transfer decal after printing but before trimming to fit the plate

Soak the trimmed decal sheet in water for 60 seconds and then apply carefully, ensuring you line it up precisely. Leave to dry but remember to adjust the spindle as it dries to break the bond between the spindle and transfer.

Fixing the electronics

When received, the set was noisy and did not receive any signals. Changing a few resistors in the audio stage cured the noise and replacing a couple of OC171s produced the signals, and allowed alignment. I was lucky with this receiver because I was able to find enough good OC171 transistors to get it working. However, the 'Tin whisker' problem will kill all these devices eventually (check the web for NASA papers on the subject, which is a very severe problem with certain types of old transistor, and with any high-tin material in electronics – including lead-free solder – and has already led to the premature demise of at least one satellite) so I feel that conversion to more recent (probably silicon) devices is inevitable and this is forgiveable if you want to keep these sets working. I bought a dozen OC171s from 'new old stock' and only four worked, and for how long?

Finishing the case

The original case was not in great shape, so I sent it to a powder coating company for refinishing. The result was mixed – I found that their process was not good at revealing fine detail and gave some trouble with the loudspeaker grilles (I had to clean the holes of paint). So next time I might ask them to just sandblast, and then paint myself using car spray. However, the coated finish is very nice and robust and the result is attractive. The finger plate is new, bought from Ian Nutt.

Illustration 5: The front of the finished receiver

Power supply

My receiver has the S924 mains power supply. This is useful but is a safety hazard and must be modified. The problem is that unshielded mains is present on both the power supply plug and on the switch attached to the RF Gain control. Mixing 9v DC and 240v AC mains on the same plug and cable assembly is a definite no-no. The plug is keyed and therefore should not be easy to insert wrongly, but the keying is very insubstantial and a brute force reversal by accident would destroy the receiver in a flash (literally). The solution is simply to remove the mains from the PSU/Rx socket and use the mains socket or a line cord switch as the power isolating switch. Remember that with PNP transistors, the supply is connected with positive to earth.

The old PSU circuit used a full-wave selenium plate rectifier and was regulated only by a zener diode. I replaced the rectifier by a silicon bridge salvaged from an old VCR and added an LM337 regulator to improve stabilisation of the receiver. The modified supply can be seen in the picture. The PCB is a piece of old stripboard with a 0.15in grid. The tracks run left-right underneath and are not cut except to clear the mounting screw. I made it adjustable with a 1K preset but you could use a fixed resistor to set the voltage. I set it to 9.5 volts as this represents a new set of batteries. My transformer had an additional wire, not on the circuit diagram, that emerged from the secondary which I insulated and stored out of the way. As the regulator is fully protected against overload and overheating the output fuse was no longer needed so I removed it from circuit. The LED is simply a tell-tale that I always fit to power supplies when I am working on them. I leave them in even though it can't be seen from outside the box. The regulator is attached to the outside of the case using an insulated thermal mount because the tab is connected to Vin not Ground. Mounting here means that the energy lost (about 1.7W when the dial lights are on – which they can be all the time when using this PSU if you short the push button) is dissipated away from the tuned circuits. The new circuit is shown below:

Illustration 6: Internal view of stabilised power supply

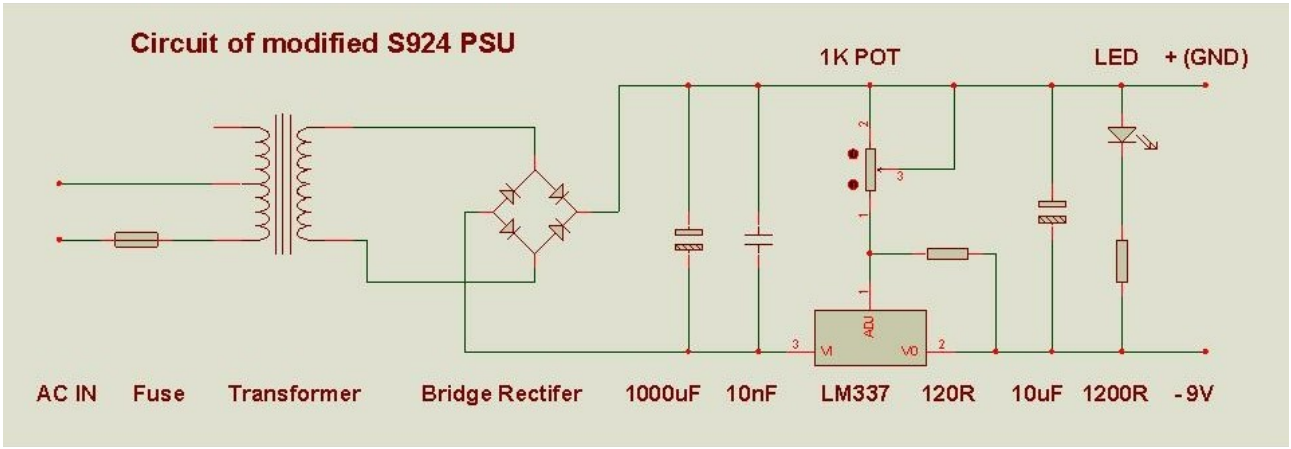

Illustration 7: EC10 regulated PSU

Conclusion

I realise that some may feel that this is not the way to treat a venerable radio. But as they say when people complain about getting old - consider the alternative! In this case an unsafe radio with a flaking dial that eventually is scrapped. Nothing I have done cannot be undone. And I now have an attractive mechanical marvel (Eddystone dial mechanisms are world famous) that sounds good and looks fine in my house.

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