

# TECHNICAL SHORTS'

by Gerry O'Hara, G8GUH

**'TECHNICAL SHORTS'** is a series of (fairly) short articles prepared for the Eddystone User Group (EUG) website, each focussing on a technical issue of relevance in repairing, restoring or using Eddystone valve radios. However, much of the content is also applicable to non-Eddystone valve receivers. The articles are the author's personal opinion, based on his experience and are meant to be of interest or help to the novice or hobbyist – they are not meant to be a definitive or exhaustive treatise on the topic under discussion.... References are provided for those wishing to explore the subjects discussed in more depth. The author encourages feedback and discussion on any topic covered through the EUG forum.

## Fabrication of a 'MkII' (Alan Clayton Style 'E') Steel Case – by Gerry O'Hara, G8GUH

### Background

Back in November, 2006, I wrote an article dealing with restoration of a 'parts set' Eddystone S.940. The set had been donated to me by Pat, a member of the local SPARC radio museum with some components missing, in part dismantled and with a reported 'incurable fault' that had led to the set's demise to 'parts set' status, as well as it being 'nude' (no case). Work undertaken in that article included initial cosmetic, mechanical and electronic repair work and a preliminary re-alignment. One of the remaining things that needed to be done was to fabricate a suitable steel case for the set. This Technical Short comprises an extract from the second installment of the S.940 restoration article dealing with the fabrication of the case. The type of case described was fitted to Eddystone receivers from 1962 onwards, including models S.770/R MkII, S770/U MkII, S.830 series, S.850 series, S.940, S.960 (solid state) and the EA12. It is characterized by being constructed from a single wrap-around steel sheet having large side perforated ventilation panels; some versions (eg. as fitted to the S.830 series) also had similar, but smaller, ventilation panels in the top and bottom. The rear panel comprised another steel panel having three large holes in the lower half to allow access to the various connectors on the receiver chassis and two perforated ventilation panels above. The case is held in place by four large knurled thumbscrews at the rear.

### Decisions, Decisions...

I deliberated on whether to make a case out of Perspex (otherwise



known as acrylic or 'Plexiglas') as I had done for my S.750 (see the Tech Short #4 on making an S.750 case). In the end I decided that I wanted a steel case for the S.940, looking the same, or similar, to the original. The choice was then either to have one fabricated by a small 'fab shop' or make one myself from scratch. Metalwork is not my strong point, so I obtained a few quotes to have the case 'fabbed'. The lowest quote was in the \$350 (Canadian) per unit region for three-off, plus the cost of powder coating, say \$50, bringing the total price to over \$450 with applicable taxes per unit (more if I only had one made). Although this is probably a reasonable commercial rate, given the amount of work involved, I decided that this was quite a bit more than I was willing to fork out, as a complete S.940 receiver with a case can be bought for this sort of sum, so thought that I would at least have a try at making a case from scratch.



I decided to use the case belonging to my S.830/4 as a pattern, but to simplify the construction somewhat to suit my (lacking) metalworking skills. Pat offered the use of his metal-bending jig ('bending brake') if I needed it and also his MIG spot-welding kit, so, step by step, here is how to fabricate a functional, if not that faithful, reproduction 'MkII' or Style 'E' Eddystone-type case from scratch (or at least one way...).

- Decide on the case design: I opted to base the design on the original ('prototype') but to simplify it somewhat, considering that to exactly replicate the original would be difficult given my limited facilities and minimal metalworking skills. My simplified design would comprise:
  - a single sheet of plain 20 gauge steel bent to wrap around the rebated section of the front panel casting, joined along a rebated overlap underneath (spot welded). The dimensions for this piece of steel are 51" (including allowance for the overlap) x 11.75".



Above: the wrap-around piece of plain steel for the top, sides and base of the case marked ready for bending. Left: If you have access to one, use a proper 'bending brake', otherwise (like me) make a simple bending jig using wood and G-clamps: the corner of one piece of 2"x4" is shaped to the desired inside radius of the bends.

- a piece of perforated 20 gauge steel to form the upper rear panel – I decided to omit the lower half of the rear panel completely to simplify construction – this would simply be the exposed rear chassis of the receiver (I thought making this to replicate the prototype would involve significant fabrication effort to a piece of plain steel to cut



the three access holes for the rear panel connections etc, tool the edges and then cut the larger holes for the two rear perforated ventilation panels) and besides, my set has had a PL259 socket fitted that would necessitate a non-standard centre cut-out (unless I removed the socket, which I am not, as it is quite handy). The

Above: the S.940 with the wrap-around case section fitted and the rear perforated panel being marked-up for bending. Below left: the rear panel having its ends and upper edge bent to form the angle return to fit inside the wrap-around section.



dimensions for this piece of perforated steel are 17.5" x 5.5" (including allowances at each end and along the top edge for bending returns to allow welding inside the wrap-around case section).

- two pieces of perforated 20 gauge steel to form the side vents. The dimensions for these pieces of steel are 9.5" x 7.5", including allowance for overlap and spot-welding.
- four ready-made steel angle brackets: two supporting the lower edge of the perforated

rear panel (also acting as pull-handles to facilitate easy removal of the case - a source of frustration to many Eddystone owners) and two to be spot-welded into the lower rear corners of the case to provide some additional rigidity and to take the lower case securing thumbscrews.

- Obtain the necessary metal parts from a local supplier – 'Metal Supermarkets' in North America will supply and cut small quantities of metal to suit. I decided to use 20 gauge steel for the case as although this is a little thinner than the original case construction (18 gauge?), it is easier to work by hand and is still adequately 'self

Below right: cardboard template for marking the side panel cut-outs for the perforated steel ventilation panels. Below left: using a Dremel to make the side panel cut-outs using a steel bar as a guide.



- supporting' for the longer dimensions used in the case. I managed to buy some perforated steel having an identical perforated pattern to the original ventilation panels.
- Carefully mark the solid steel panel along the four corner bend points, taking care to make these at right-angles to the edges
- Bend the upper corners first along a suitable radius form and repeat for the lower bends.
- Check the fit of the wrap-around section onto the receiver chassis/front panel rebate and adjust if necessary and mark the joining edge for best fit.
- Bend the overlapping strip to form a 'step' for a rebated join.
- Spot-weld the two ends of the wrap-around case section along the rebate.
- Bend the ends and top of the upper rear panel section perforated steel to form angle returns to fit inside the wrap-around case section.
- Install the rear panel into the wrap-around case section.



Above: side panel cut-outs 'roughed out' ready for grinding the corners into shape using a Dremel high speed rotary tool. Next page: the non-standard 'easy-pull' rear panel details.

- Check the fit of the wrap-around case section with the rear panel fitted onto the receiver chassis/front panel rebate and adjust if necessary for best fit.
- Remove the wrap-around case section and rear panel from the chassis and spot-weld the rear panel in place within the wrap-around section.
- I bought four steel angle brackets from a local DIY store (two large, two small): the two larger ones used to brace the rear panel and the two smaller ones to form the lower thumbscrew mounts (photos below and right). Locate these in the case, check fit and spot-weld them into place.
- Fit the case onto the receiver chassis/front



panel and mark holes suitable for the knurled 2BA securing thumbscrews.

- Remove the case and drill the holes for the securing thumbscrews.

- Mark the side panel ventilation cut out locations on the sides of the wrap-around case – use a cardboard template.
- Cut the side panel cut-outs using a Dremel (high-speed rotary tool) or similar, file/grind the edges smooth.
- Spot-weld the side ventilation panels in place.
- Use the Dremel to clean up all the spot welds, finish with 600 grade Emery paper.



- Clean the completed bare-metal case using suitable solvent in a well-ventilated area.
- Powder-coat the completed case.
- Install four stick-on rubber feet onto the four corners of the case bottom.

- Run a length of insulating tape along the inside of the case, in a line above the three dial lamp holders – a precaution as these have a habit of shorting to the case over time.
- Fit the completed case to the receiver chassis.
- Fit the four knurled 2BA thumbscrews (add a washer on each to protect the case finish), tighten-up and that's it...

The resulting construction is by no means a 'perfect replica' of the original but it meets my needs – I don't see the point in paying more for a replica case than the radio is worth – and in my opinion the case as described and constructed above serves the purpose of protecting the receiver, the operator and generally looks the part at least from the front, top and sides (which is what folks see most of the time). The total cost was about \$22 (Canadian) for the steel, \$3 for the brackets and \$50 for the powder coat (the latter was a



Above: underneath view before powder coating. Below: completed case test-fitted to the (working) chassis prior to powder coating.



bit more expensive than for my S.830/4 case – this time the powder coat shop was not using a dark grey for any of its commercial production runs, so it meant setting-up specially for my case), total \$75 (ie. about £33 all-in) – you could save some cash by using auto spray paint. If you had to pay for the spot welding, probably add another \$60 (an hour or so to complete – thanks Pat!). I estimate that the case took a total of about 6 hours for me to fabricate, including an hour or so for Pat to do the welding, but not including shopping for the steel and brackets, or taking it to/from the powder coat shop.

### Conclusion

The metal case was not too difficult to construct and certainly not beyond the means of someone with even a modicum of metalworking ability. Indeed, in retrospect, I even think that a rear panel to the original Eddystone pattern (as on my S.840/4, photo, right) would not be beyond a dexterous pair of hands and a few good hand tools – maybe by omitting the



rebates on the ventilation panel cut-outs and the rolled edges on the three connector cut-outs. Another option would be to make the rear panel from a single sheet of perforated steel, this being much easier to bend than the plain sheet and would need only the three lower cut-outs to be made. One good thing about my current design though is that the case is a cinch to remove compared to the Eddystone original – simply grab the two sturdy metal strips at the back (fingers can reach right around them) and pull hard... off it comes.

So, there you have it - a serviceable and not bad looking case for your Eddystone (see photos of the powder coated completed case on the next few pages) - if you decide to give it (or similar) a go for your 'naked' set, may I wish you the very best of luck with your 'fabbing'!

73's

© Gerry O'Hara, G8GUH ([gerryohara@telus.net](mailto:gerryohara@telus.net)), Vancouver, BC, Canada, March, 2007





Below: several views of the completed 'homebrew' case after powder coating.



Below: bottom and rear views of the completed case: note the 'easy-pull' rear handles (angle brackets) – not as per the 'prototype', but they work great...



Below: two more rear views of the completed case with chassis fitted and working.

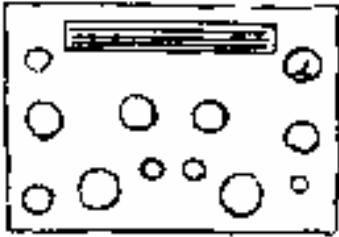


Below: two front views of the completed case with chassis fitted and working – looks like it just came out of the Bathtub... almost.

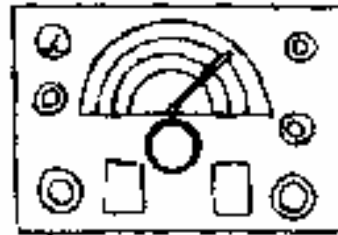


Below: Eddystone receiver case styles as defined by Alan Clayton on his excellent website ([www.qsl.net/eddystone/cases1.html](http://www.qsl.net/eddystone/cases1.html)) - although the site is currently 'down' for updating).

**Case "A"**  
Eg ECR



**Case "B"**  
Eg 358, B34, 460



**Case "C" Die-cast aluminium**  
Eg 504, 640, 670, 680, 740



**Case "D" Die-cast aluminium**  
Eg 680X, 730, 770R/U, 840, 868A



**Case "E" Pressed steel**  
Eg 840C, 850/2, 940



**Case "F" Pressed steel**  
Eg EC10, EB35/36, EY11

