

'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.

Making a Replica Plinth Speaker

Introduction

Tech Short #18 touched on the ergonomics of operating an Eddystone receiver, noting that many folks find it more comfortable to operate, particularly for extended periods, if the front panel is raised from the operating surface by a few inches. Also, the dial can be easier to read if it is sloped at an angle such that it is 'normal' to the line of sight of the operator. Eddystone recognized this in the mid-1940's and introduced the Type 774



Mounting Brackets made from die-cast aluminium (Photo, left). The QRG notes these as being 'rare as hen's teeth' and Graeme is probably correct, as I keep a close watch on EBay and have only seen them for sale a couple of times in the last 18 months or so, and the EUG Members Survey notes that at the time of conducting the final such survey in 2006, only 10 members reported having any of these in their possession (up from only 4 in 2001). The Mounting Brackets were designed for the post-war Eddystone cases that were in use from 1946 through 1961

(case styles 'C' and 'D' in Alan Clayton's nomenclature – see <http://www.qsl.net/eddystone/>). These accessories formed part of a small line up of 'add-on's to the Eddystone range for those 15 or so



years, which included the die cast case loudspeakers (Photo, above right) - Models 688 (7") and 652 (5"), and die cast case S-Meter, Model 669 (Photo, left). With the introduction of the 'MkII' receiver styles in the early



1960's (Alan Clayton case Style 'E'), Eddystone introduced a new concept that combined the ergonomic improvement offered by the Mounting Brackets with an integrated

loudspeaker and the facility to add additional switches/controls: the Type 906 Plinth Speaker (period illustration, below right). This simple pressed steel constructed unit included an elliptical speaker behind a rounded-corner speaker cut-out covered by a perforated-steel panel to match the ventilation cut-outs in the MkII style cases. The Type 906 was superseded by the Type 989 (below left), which looked very similar but had a more 'angular' look and sported the 'new-style' Eddystone badge. The QRG notes that the price of the 989 was £30 in 1980 – a significant cost compared with the actual

receiver cost. This could explain why they are noted as being 'very rare' in the QRG and why the EUG members Survey recorded only 6 (Type 906) owned by members in 2006. Having said that, I have noted several



for sale on EBay over the last year or two, some at reasonable cost, though for me, the shipping charges to Canada put the cost way over what I am prepared to pay for a piece of bent steel... so what is a guy to do that would like to have one of these for his S.830/4 and/or his S.940? Make one of course! In the QRG, Graeme suggests that plywood can be used – which I am sure it could be, but I felt that would not be very 'authentic'. So, following a suggestion by Mike Cassidy and feeling inspired by constructing the steel case for my S.940, I decided to have a go at making a replica plinth speaker from steel, powder coated to match the radio cases. This Tech Short describes the construction of a Type 906 replica, which I feel is not beyond the efforts of any reasonably-skilled DIY'er using hand tools and with a few hours to spare.



Case Details

Not having 'hands-on' access to a prototype of either style, I contemplated simply making a visual copy from the illustrations and photos I have on file, gauging the dimensions by comparing with other (known) dimensions of the receivers. Then I noted that Mike has a collection of 'MkII' style receivers that he sent me photos of and all were sitting on said plinth speakers of varying styles. Contacting Mike on this, he noted that some were original Eddystone units and others were replicas. So, I asked Mike if he could send me some photos and dimensions taken from the original units on which to base a replica of my own.

Mike duly agreed to my request and I also had an offer of same from Amanda (MODZO) – thanks to you both. A few weeks later photos, dimensions



and even tracings of both types of plinth speaker arrived, once again attesting to the helpfulness and collegial spirit of the 'Eddystone community'. For the record, here are the descriptions and major dimensions of both types of plinth, as recorded by Mike:

Type 906

The Type 906 is 16" wide and 3 1/4" high at the front. The sides are 10 3/4" long and 3/4" high at the rear. The speaker grill is 7 1/2" by 2 1/16" with radiused corners, the grill mesh being a separate piece of perforated steel inserted into a cut-out in the front of the plinth.. The corners of the plinth are also radiused (approximately 1/4") to give a gentle bend.



Above: Mike's 'original' Type 906 plinth sporting his S.940

Type 989

The (possible) original Type 989 is 16" wide and 3 1/4" high at the front. The sides are 11 1/16" long and 7/8" high at the rear. The speaker aperture is 7 1/2" by 2 1/16" with right angle corners. The corner bends of this type of plinth are also right angles. The speaker fastening bolts are visible as in the picture on page 55 of the QRG. The Type 989 replica's are 15 15/16" wide, 3 5/16" high at the front and the sides are 10 9/16" long and are 3/4" high at the rear. The speaker grill is punched directly into the plinth rather



Above: One of Mike's 'clone' Type 989 plinths with the punched panel

than as a separate grill mesh. The speaker grid measures 7 1/2" by 2 1/8". The plinth corners on the Type 989 clones are also right angles.

Below: what no speaker? – another of Mike's 'clones', here sporting his EA12



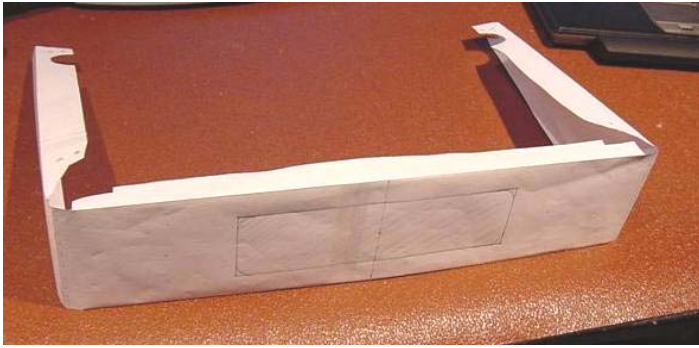
Fabrication

The plain mild steel sections and small piece of perforated steel for the speaker cover were obtained from 'Metal Supermarkets'. For a Type 906 plinth you will need:

- 20 gauge mild steel, 38" x 4 3/4"
- 1mm perforated 20 gauge mild steel (for the speaker grill), 3 1/4 x 9"

The above are slightly 'generous' to allow a little extra for bending/trimming, and for the perforated steel, to allow for welding overlap to the front panel cut-out. While I was at it, I decided to build two identical Type 906 units: one for my S.830/4 and the other for my S.940. Total cost of the steel for the two plinths, pre-cut to the above sizes was Cdn\$13.

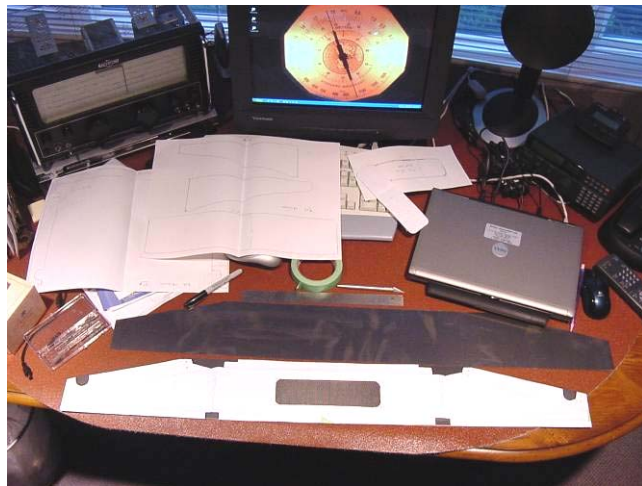




A paper 'mock-up' was then made, cut from the dimensions and tracings provided by Mike (Photo, left). This seemed to work ok, so I decided to unfold the mock-up and use this as a template for marking up the steel (Photo, below). The larger cuts were made first, removing the excess on the sections that would

form the sides of the plinth, followed by the various cut-outs near the front corners etc., the smaller more intricate cuts and the speaker cut-out being made with a 'Dremel' high-speed rotary tool using abrasive cut-off disks.

I considered bending the steel on my bench, possibly scoring along the bend lines with the Dremel tool first to encourage accurate bending, but I was offered the use of Pat's 'bending break': unfortunately it was a 36" wide unit – not quite wide enough to fit the longest dimension of the plinth and awkward to bend most of the smaller dimensions. In the end, the bends were mostly started with the bending break and finished off using a hammer and a large bench vice. The end results are perhaps not the best, but are certainly acceptable. The radiused corners were bent around a 1/2' socket wrench shaft. The speaker grill was then (MIG) welded into the main metal panel. Four screws were



welded to the inside of the plinth to allow fixing the speaker (I decided to mount the speaker on a piece of 3-ply wood and then fix that assembly to the welded-on plinth screws – this on advice from Mike that this approach significantly improved audio quality as well as facilitating swapping speakers in the future if I decided to replace them). Holes were drilled on the top flange surfaces to match those in the prototype, the locations being double-



Above: The prototype Type 906 plinth, less its S.940

checked with the threaded bushings in the base of my S.830/4 case. The completed plinths were then sanded down to remove weld scars and other blemishes (minor vice and hammer marks), de-greased/cleaned and then taken to the local powder coat shop (cost was \$10 per plinth for powder coating).



Above: Both of my replica Type 906 plinths under construction - after bending and installing the perforated metal speaker grills (note photo of the prototype in background)

hammer marks), de-greased/cleaned and then taken to the local powder coat shop (cost was \$10 per plinth for powder coating).

Speaker

Mike noted that the Type 906 prototype was fitted with an elliptical 'ELAC' 3 ohm speaker driver. Finding any speaker with these dimensions was a bit of a tall order... Antique Radio Supply appear to currently stock only one elliptical unit -

(Part #P-A69E8C) rated at 4 ohm, 8 Watts, so electrically ok, but at 6" x 9", not much use. Their 2004 catalogue contains a second (Part # P-A6375-3A) that is a 3 3/4" x 6" unit at 3.2 ohm with no wattage specified – the latter would have been slightly too large on its smallest dimension anyway. Most of the local electronic stores I visited and even some second hand/electrical 'junk' stores from as afar afield as Portland, Oregon, only stocked small round 8 ohm speaker units, down to 2.5" or so diameter.

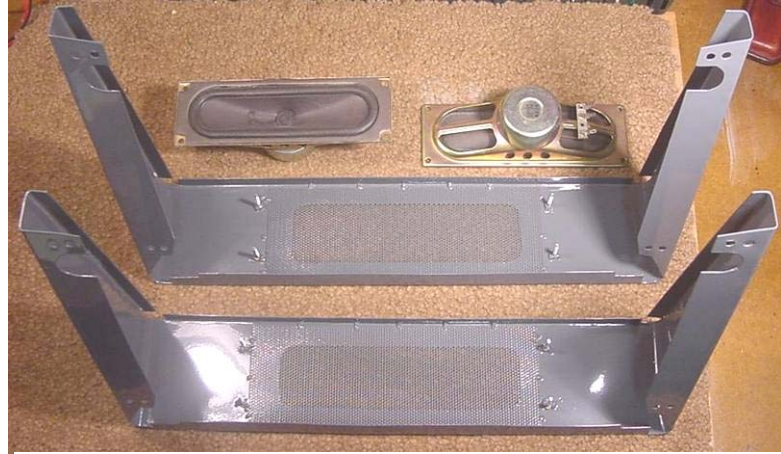
However, over a period of a few weeks I managed to acquire a selection of small elliptical speakers, most a bit on the small side (but all costing <Cdn\$1 each), including two matching pairs. Then



Above: Trying a speaker out for size – a bit small this one

I visited a local electronic parts supplier (Lee Electronics, Main Street, Vancouver) to obtain some good quality high voltage electrolytics for a domestic set I am currently restoring (a 1930's Philco 16B) and, happening to glance up above my normal line of sight, spotted two quality-looking speakers of almost perfect dimensions (actually 7 1/4" x 2 5/8"), albeit 8 ohm impedance (but rated at 3W) and costing an 'exorbitant' at Cdn\$8 each... the obvious lesson here is to persevere! I bought them on the spot.

For each plinth, a small panel was cut from $\frac{3}{16}$ " 3-ply wood with cut-outs to match the speaker, coloured black on the front side (behind the perforated metal speaker grill) and the speakers mounted onto them with small woodscrews - the complete sub-assemblies then fixed to the plinths using the welded-on screws, small wingnuts and washers. Simple 'flying leads' were

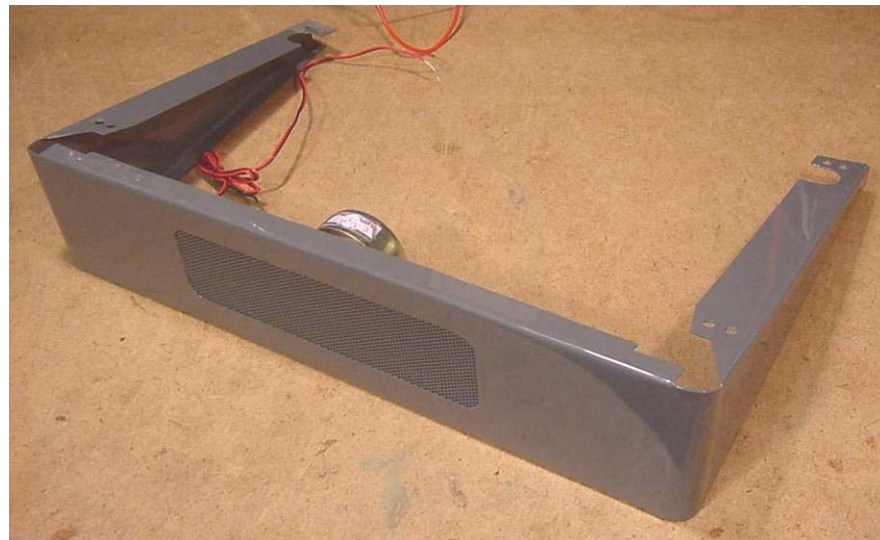


Above: The plinths after powder coating, with the speakers selected for fitting. Below left – the 'ELAC' label affixed



attached to the speakers ready for connection to the sets speaker output terminals and small rubber strips were fitted to the base flanges to protect the surface on which the plinths are placed. To add a touch or 'authenticity', I affixed a reproduction 'ELAC' manufacturer's label to the magnet of each speaker.

The finished plinths would normally fix to the MkII style cases using screws that are passed through the holes in the top side flanges into the threaded holes located in the base of the MKII style case. I did this for the S830/4 case (an original) and for my



Above: One of the completed plinths, speaker fitted and wired ready for fitting to a receiver... compare to the prototype on Page 5

homebrew S.940 case (which I have not drilled) by simply resting the case on the plinth, fixing it in place with some sticky Velcro pads. Interesting to note that the total cost of the parts to make one plinth (including powder

coating) was CDN\$24.5, or about £12: the cost of the prototype was in the order of £2 back in the mid-1960's (see price list, right).

Cat.No:	Description.	£.	s.	d.
<u>ACCESSORIES.</u>				
731/1.	Doublet Aerial.	3.	3.	3.
906.	Plinth Speaker.	1.	19.	4.
924.	Power Unit.	5.	0.	0.
935.	Cabinet Speaker.	2.	2.	0.
938.	Battery Box for EC10.1.	7.	6.	6.
	Fixing Plates for EC10 Rx.pr.	12.	0.	
LP.2924.	Telephone Headset.	4.	6.	6.
LP.2921.	High Quality Telephone Headset.	8.	5.	0.
902.	Edometer.	19.	10.	0.

Conclusion

My S.830/4 and S.940 are now fitted to the two replica Type 906 plinths and they both 'look the part' – although the sound quality is a little better using an external speaker of larger dimensions for broadcast speech and music, it is nevertheless quite acceptable for broadcast speech and communications listening, especially SSB.

Replica Eddystone plinth speakers are fairly straightforward to make: the ones I constructed are not absolutely 'perfect' if you look really closely (and I deliberately chose to differ the speaker mounting method to improve the sound by adding some wood), but the receivers certainly look good on them and, of course, the more ergonomic presentation of the slide rule dial and controls adds to operating pleasure and enjoyment. Now, how do I go about making a replica Type 688 and/or 652 for my S.740 and S.750? - I'm working on it...

© Gerry O'Hara, G8GUH, Vancouver, BC, Canada, July, 2007

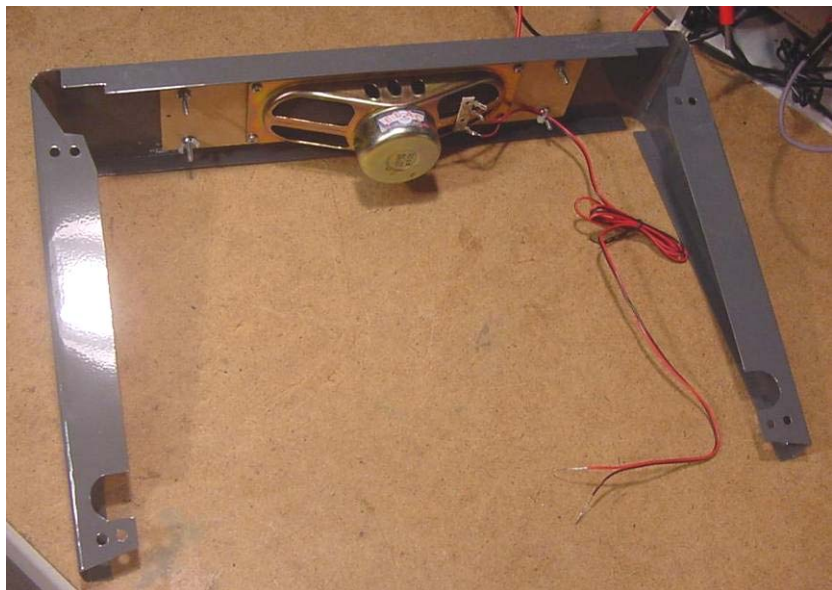
Some Useful References (EUG Website)

- Ultimate Quick Reference guide, EUG
- Eddystone Accessories Booklet (March, 1971)

Making a Type 906 Plinth Paper Template

- Front width: 16"
- Front Height: 3 1/2"
- Side Length: 10 3/4"
- Rear side height: 3/4"
- Top side flange width: 1 1/4"
- Top side flange rear cut-out: 3/4" x 1"
- Bottom side flange width: 1/2"
- Top front flange width: 3/4"

To make a paper template for the Type 906 plinth, print the attached side and



Above: Rear view of one of the completed plinths, speaker fitted to the small wooden baffle and wired ready for use

(half) front mirror-image templates, make a reverse tracing of each and join A to A and B to B (use 'magic' sticky tape) to make the full template. Double-check the reproduced dimensions match those in the above table above before using the template (if it is not reasonably accurate, try scaling the print size up or down until a good match results).

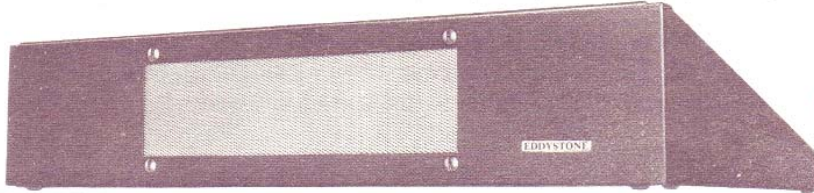


Above: One of the completed plinths fitted to my S.830/4. Below: My S.830/4 and S.940 looking like twins – proud as punch with their new 'jaunty' stances



Cat. No. 989 An extremely strong plinth loudspeaker unit designed for use with receivers in the Eddystone range, but usable with any receiver if the underside of the cabinet can be drilled to provide suitable anchorage. Construction is of steel, rustproofed and finished grey. The loudspeaker is an efficient elliptical type suitable for $3\ \Omega$ circuits.

The unit tilts the receiver panel into a more convenient operating position, making scales more easily readable and controls more accessible. The space on either side of the speaker aperture can be utilised for ancillary controls and switches which may be required in certain installations. Height at front: 84mm(3.312in). Width: 406mm (16in). Depth: 267mm (10.5in). Weight: 1kg (2.25 lb).



Cat. No. 989



