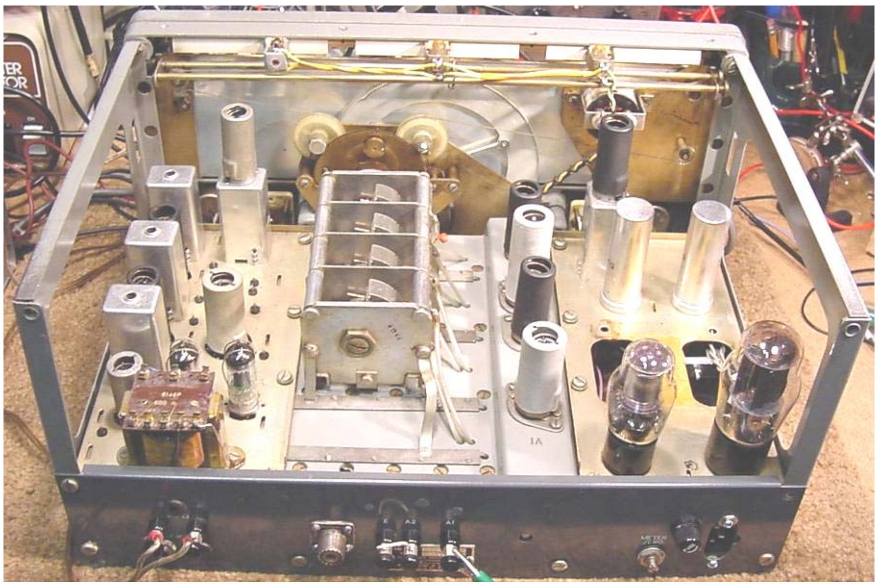
Restoration of a 'Parts Set' Eddystone S.940: Part 2 – Mains Transformer Installation, RF Coil Installation, Other Sundry Repairs and Fabrication of a Steel Case – by Gerry O'Hara, G8GUH

Background

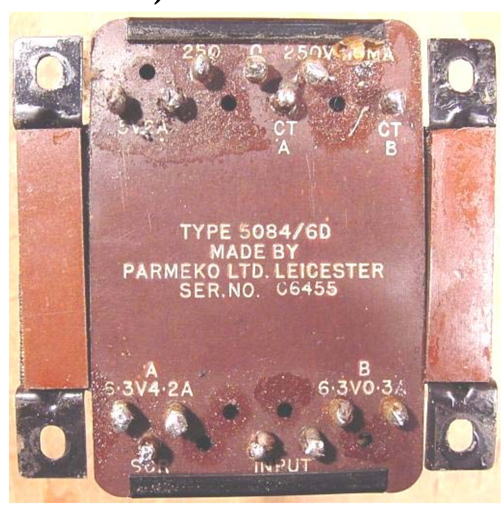
Above and Below: my S.940 following the restoration efforts described in Part 1 of this article… working and looking pretty good, but lacking a mains transformer, case, coilbox cover, Band 4 RF transformer, correct spool-pulley bolts, and with a homebrew dial lamp holder (far left on photo below).

Back in November, 2006, I wrote an article dealing with the 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. The set had parts missing, was part dismantled and with a reported 'incurable fault' that had led to the set's demise to 'parts set' status. I had always wanted an S.940 for my collection and so I decided to do my best to restore it cosmetically and bring it back to a fully working condition. Work undertaken in that article included initial cosmetic, mechanical and electronic repair work, a preliminary re-alignment and powering the set from a 'donor' S.770/R. At the conclusion of that article, the set still had no power transformer, a missing Range 4 aerial coil, a missing coilbox cover and a few other issues, but it was working pretty well and looked much better than it had on arrival. This second and concluding part of the S.940 restoration describes the testing and fitting of a power transformer, a new Range 4 aerial coil, various other minor repairs and tests, final re-alignment and the fabrication of a new coilbox cover and steel case.



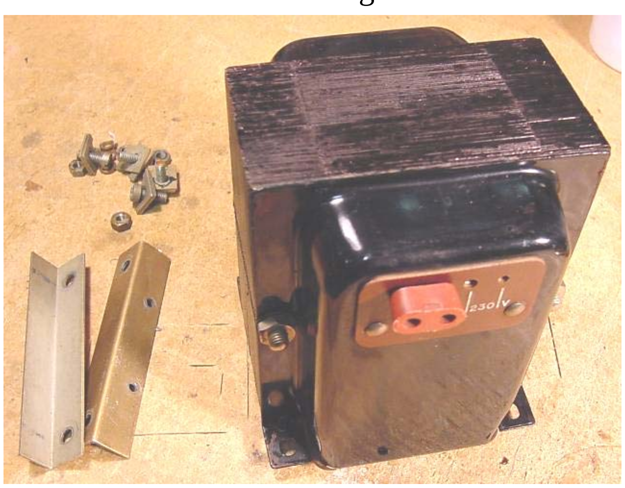
In late-2006, I called Dave Simmons who confirmed that he was able to supply some of the still needed (Eddystone-specific) parts, including a new brass tuning shaft bush (he had some of these machined), dial lamp holder and probably even a Band 4 coil/trimmer assembly (or at least something very similar). About that time, Dave decided to sell his stock of Eddystone parts, subsequently bought by Ian Nutt, and this handover placed a small hiatus into the ongoing repair effort over Christmas 2006 and into the New Year.

Transformed! (and how measuring HT current on one side of the Atlantic suggested a fault in a cascode RF stage on the other side…)



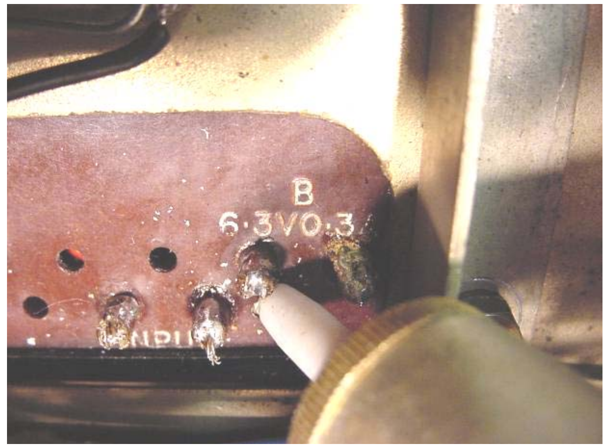
In the meantime, Pat very kindly handed me the transformer from his S.750 'parts set' (this happens to be the same part No. as the one fitted to the S.940 sets, ie. a 3937P). Things were looking up for the S.940 – with some luck the transformer would be ok and the set could be powering itself before too long…

The 3937P transformer was cleaned-up and the windings checked for continuity and insulation resistance – it tested ok using an ohmmeter – so it was then tested externally to the set, applying the mains voltage to the transformer primary and checking the secondary voltages were ok: they were – phew! The 'umbilical' HT and LT wires connecting the S.770/U power supply to the S.940 were disconnected and the standard power supply wiring in the S.940 re-instated. The transformer was then fitted into the correct above-chassis space on the S.940 and connected-up. An extra fuseholder was wired into the circuit, located in the mains transformer HT centre-tap to

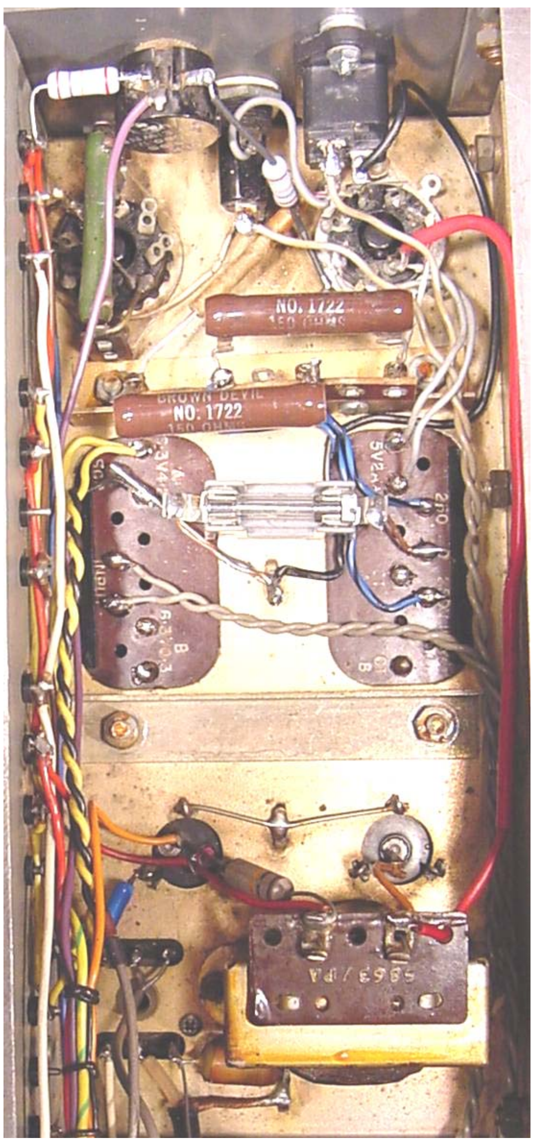


earth. This allows the HT current draw to be measured easily (by removing the fuse and connecting a mA meter instead) and affords an additional degree of protection in the event of an HT short in the set (see photo below).

Power was applied via my variac and the voltage brought slowly up to the approx 120 volts line voltage, measuring the HT voltage and current draw: much to my relief and gratitude to Pat, the set finally came to life, under its own steam this time, although the HT voltage and current draw seemed a bit

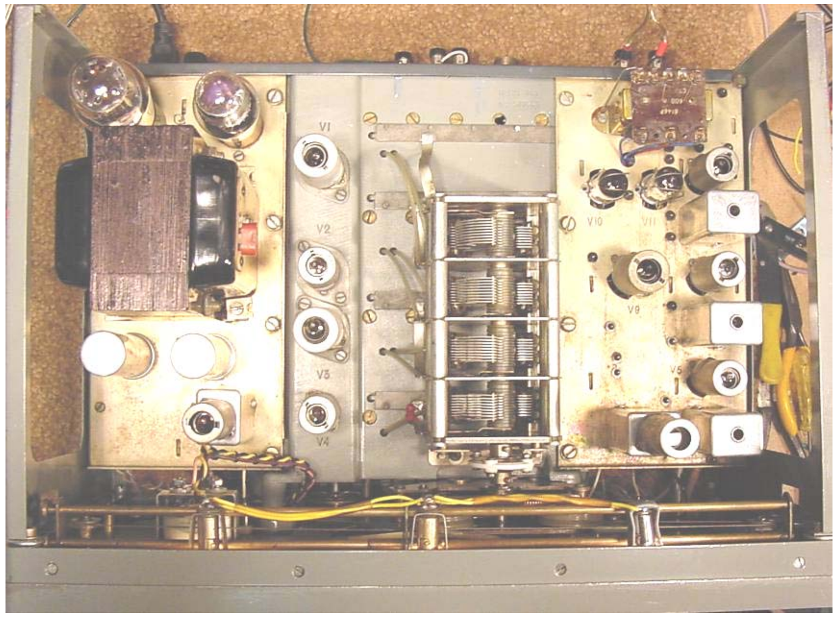


Above: cleaning-up the connectors on the 'new' transformer. Left: under-chassis view of the S.940 showing the connections to the mains transformer and the new HT fuse.



on the high side (265v HT, with the set drawing between 100mA with a strong signal tuned in and 125mA under no signal conditions. I tried replacing the two 140 ohm surge-limiting resistors between the mains transformer HT secondary and the anodes of the rectifier (V12) with 220 ohm units to see if this would reduce the HT voltage and maximum current draw. It did up to a point, although as expected, the HT voltage regulation suffered a bit, with the HT1 line changing by several volts depending on signal conditions mainly as a result of the varying HT current demand due to AGC action affecting the bias of the RF/IF stages.

The transformer seemed to be running cool enough though, so I decided to 'soak test' it for a few hours and check a few voltages around the circuit whilst this was under way. After a bit of investigation, the changes in current draw were traced to the cascode RF amplifier, however the stage voltages were within tolerance. I asked Mike Cassidy in the UK to check the HT current draw in his S.940, which he has owned from new in the 1960's. Mike's set was drawing a bit less HT current and noted smaller changes in his set's HT current draw depending on signal strength than my set did. Probing about in his S.940 (I had



Above: the S.940 chassis with its ex-S.750 mains transformer fitted and working – a few pounds heavier than in Part 1, but we won't say anything to upset it will we?

asked him to check the cascode RF amplifier in his set as a comparison to mine) revealed that the cascode RF stage was drawing only around 0.06mA with a good signal applied and 0.8mA with no signal. This was obviously far too low for such an amplifier stage and was indicative that the set was likely suffering from some out-of-tolerance resistors in that stage. After some further investigation, Mike confirmed this was indeed the case - there

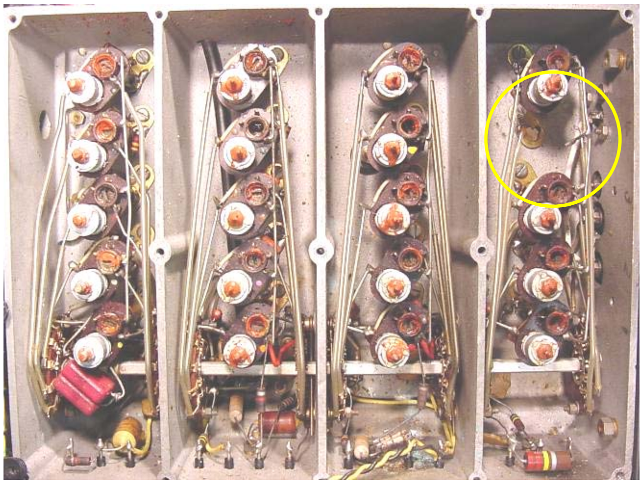
was zero volts on the grid of V1b, where it should have been 90v - and he ended up replacing the offending parts (R5, R6 for starters, which were the main problem, then the remaining resistors in the coilbox). Current draw for the cascode stage was now similar for the two sets when I adjusted the line voltage applied to my S.940 to 110v using my variac, ie. the design voltage of the transformer, not the almost 120 volts per my mains (a cascode stage current draw of around 2mA under strong signal conditions, 10mA under no signal or AGC-off conditions, calculated by measuring the voltage drop across R8). The high HT voltage and higher-than-specification total HT current draw in my set were therefore put down to be a result of the higher-than-design line voltage of 120v versus 110v. Graeme Wormald checked with the sets designer, Bill Cooke, if the excess current draw would damage the 3937P transformer (HT current capacity specified on the transformer markings as 110mA), who confirmed that the transformer was very conservatively rated:

> *"Hello Gerry, I've spoken to Bill Cooke (who designed the 940) and he says the mains tranny is good for at least a 15% overload, and that the set proved very reliable from that point of view when in service. He says if you are happy with the performance don't go looking for trouble! If there is an incipient fault keep the set running until it shows itself..*
> *73, Graeme."*

Given this comment from Bill, I decided to just run the set as it was without further investigation – I figured that I would not be running the set with no signal applied for extended periods anyway, so the HT current draw under my normal operating conditions with 120v mains voltage applied (around 110mA) was ok.

Range 4 Aerial Coil

On reciept, the S.940 was missing the aerial coil/trimmer for Band 4 (1.03 to 2.4 MHz) – I guess someone had a need for one of these in another set. As a stopgap measure, I had fitted a 470pf capacitor in place of this, at least allowing RF to reach the 1st Rf amplifier stage on Band 4. This did not work too badly, and allowed the receiver to at leaast be used on this band, albeit with a bit more cross-modulation and less selectivity than otherwise.



Above: the S.940 coilbox on arrival at my workshop – note the missing Band 4 coil/ trimmer combo, circled yellow, upper right.

Pat from the SPARC museum has a box of sundry Eddystone spares obtained from a sellar on EBay. Amongst this was an Eddystone coil/trimmer combo that looked remarkably like the missing L4/C4 unit. Pat very kindly donated the coil/trimmer combo to the cause of fixing the set (it was even in a *pukka* Eddystone

Grid Dip Oscillators

Usually found in the radio amateur's shack rather than the radio repair workshop, the grid dip oscillator (GDO) is a simple, multi-function device that can be very useful in circumstances when other test equipment simply will not do.

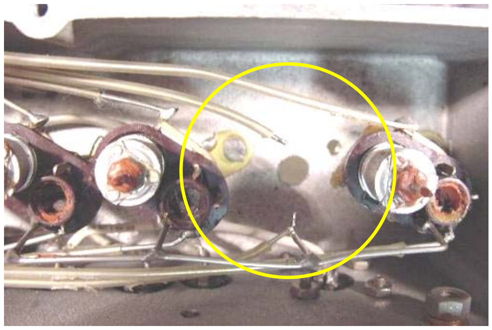
A GDO essentially consists of a tuned circuit, the coil of which is made to be interchangeable with other coils of differing inductance to allow a wide range of frequencies to be tuned (photo of my Millen GDO below). The coil and tuning capacitor form part of a simple oscillator circuit, using either a valve (usually a triode), or an FET or bipolar transistor in later designs, coupled to a meter. With a few additional switches and sockets, including maybe DC and/or audio amplifiers, the tuned circuit can be made to act as an 'absorption wavemeter' (AW), a simple signal generator, or beat frequency oscillator (BFO). Their simplicity and versatility in use) made GDO's very popular 'homebrew' pieces of test equipment for the radio amateur.

In the GDO mode, the coil of the GDO is placed so that it loosely couples to the coil of an external (un-powered) tuned circuit who's resonant frequency is to be determined. The GDO is tuned across its calibrated frequency range and the meter reading monitored until a dip occurs, indicating that power is being absorbed by the external tuned circuit, indicating that it is at resonance. In AW mode, the GDO is un-powered, and is used to check the oscillating frequency of a powered tuned circuit, as in a transmitter, here resonance being indicated by a peak in meter reading. The GDO can be used as a simple tuneable oscillator in place of a signal generator, or in BFO mode, a pair of 'phones is plugged into the GDO and when the internal circuit is oscillating close to an external oscillating circuit, an audible tone (heterodyne) may be heard in the 'phones.

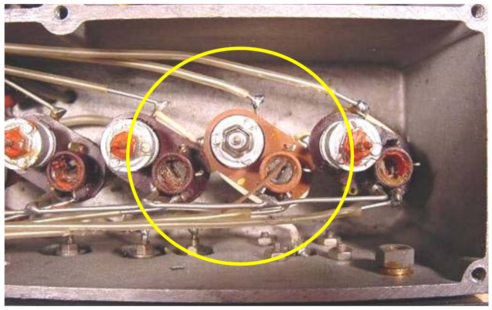
box). On close inspection, however, the windings on the coil from Pat's spares box looked significantly different to those on the Band 4, 1st to 2nd stage RF transformer.

So, I decided to check the new transformer with my grid dip oscillator (GDO) to ascertain its resonant frequency range with a similar value variable capacitor to that in the S.940 (see sidebar on GDO's) above. The secondary coil of the new transformer was measured at 4uH and found to be operating in the 4 to 12 MHz range: therefore it needed to be re-wound to be suitable for use on Band 4. I calculated this to require a coil of nominal 53uH inductance (see calculation sheet appended). The original secondary winding was removed and the unit re-wound using 85 turns of 38SWG enamelled copper wire in a single layer, a few turns less than calculated to allow for tuning with a slug core and for stray inductances, leaving the primary untouched (this seemed ok, having 20 turns, ie. around a quarter number of the secondary turns count), though fairly closely spaced (0.125") to the secondary. I then checked the new secondary with the GDO as before, noting that it covered approximately 1.0 to 2.5MHz. The re-wound unit was then fitted into the coilbox and wired up. Band 4 was then re-aligned and…… it worked, but the high frequency peak (trimmer) seemed 'flat' and the low frequency peak (slug) even flatter – I put this down to low-Q of my homemade coil (compared with an original Eddystone) and probably a non-optimized coupling between the primary and secondary: results therefore not perfect, but much better than the coupling capacitor used previously. However, some weeks prior, I had contacted Ian Nutt to see if he could located the correct transformer in his newly-acquired stock of Eddystone parts and, quite incredibly, an exact replacement coil/trimmer combo (Eddystone Part No. D2686/1) was eventualy located amongst the thousands of spare coil units in Ian's possession – so it was duly requisitioned as part of a larger parts order 'just in case'. I decided to replace the hand-wound Band 4 aerial transformer with the correct Eddystone part to see if performance could be improved. With this fitted, Band 4 was again re-aligned – this time both the low frequency and high frequency ends of the band peaked-up very nicely. Note that both coils of the real Eddystone unit are bank-wound with Litz wire (see photo above) with looser-coupling between – conducive to higher Q.

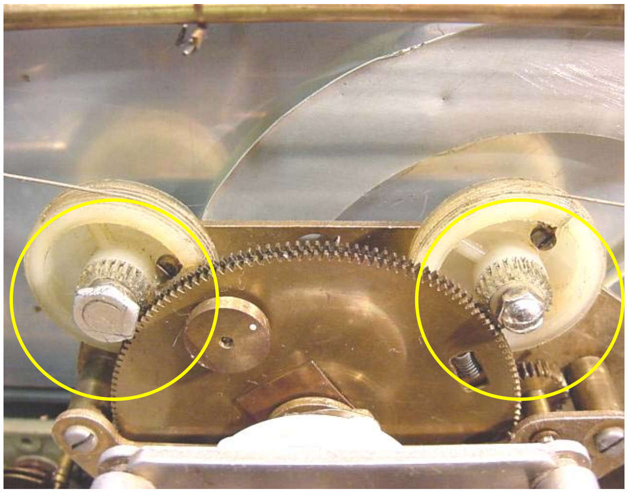
Above left: a 'pukka' Eddystone Part No. D2686/1 covering 1.03 to 2.4 MHz. Above right: similar type of coil assembly but covering some 4 to 12 MHz before re-winding for Band 4.



Above: aerial section of the coilbox with temporary coupling capacitor removed. Below: new Band 4 coil /trimmer assembly fitted and wired-in using original leads.



Spool Pulley Bolts



In Part 1, I noted that the bolts retaining the two spool pulleys were incorrect (photo, right, circled yellow): one (right) had been replaced with a screw and piece of metal tubing, the other looked to be the correct part but was damaged. Ian

provided replacements according to my description, but they turned out to be too small (photo, left – the correct type is on the left)….. a pointer here – if you possibly can, send a photo that clearly identifies the part you need as descriptions are not the best way of communicating ('a picture is worth a thousand words' is certainly true).

Dial Lamp Holder

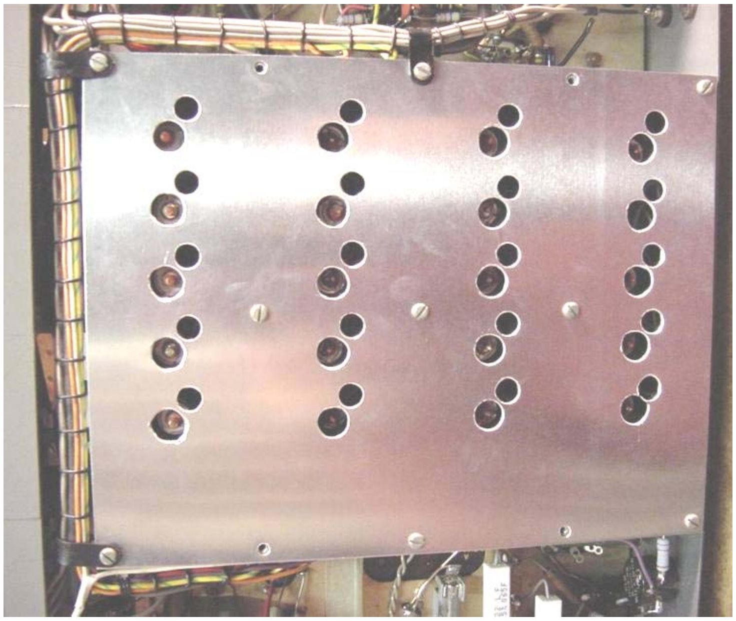
I originally made a 'scratch-built' copy of the Eddystone dial lamp holder which worked and appeared ok if you did not look too closely, but again, Ian provided the correct spare part, which was duly fitted as part of the present phase of work on the set.

Coilbox Cover

I would guess that as the set was resigned to being a 'parts set', replacing things like the coilbox cover and the case were not thought necessary. Hence, on arrival these pieces of metal were missing. Taking a look at what was required by way of maintaining access to all the RF coils and associated trimmers, plus the 13 mounting screws, I decided that it would be easiest to fabricate if I had

a template from another S.940 set. Mike Cassidy was able to oblige, taking a photocopy and a tracing of the cover fitted to his S.940 (top of photo at base of previous page).

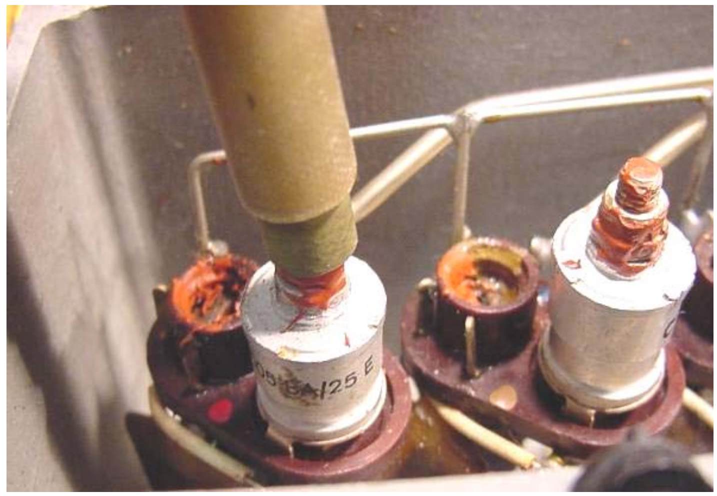
A suitable piece of aluminium sheet was obtained from a local supplier (Metal Supermarkets), who cut it to size for me. I then used the template to centre-punch each of the mounting screw, coil and trimmer holes and then drilled them out using a hand electric drill, filing the rough edges/burrs from the holes. The result was not perfect (punched holes would be much better, or even undertaking the job using a drill press), but is acceptable (see photos), fits perfectly and is fully-functionally, ie. it affords access to all the coils and trimmers to allow alignment with the cover fitted. Total cost $5.



'Final' Re-Alignment

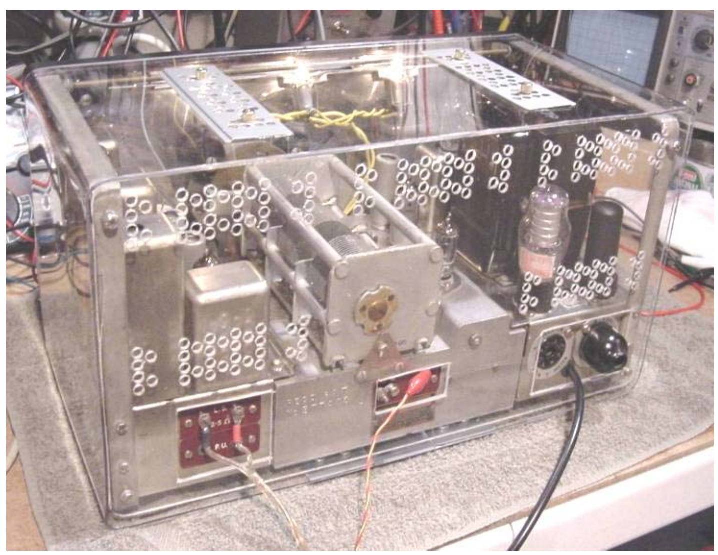
Of course there is no such thing as a 'final' re-alignment, but I felt that as I had been doing work in the coilbox and had now fitted the coilbox cover, as well as soak testing the set for several days with its own power supply and slightly elevated HT voltage, it was probably reasonable to perform another re-alignment, this time with the coilbox cover in place. Prior to starting, I replaced several of the RF coil slugs and a couple of the IF transformer slugs using new ones supplied by Ian Nutt (note: the IF transformer slugs ar fatter than the RF slugs). This time I did not use the 'knicker elastic' method of preventing possible vibration movement of the slugs, but on the advice of Mike Cassidy, applied a little Rocol *Kilopoise 0868GW* damping lubricant which is designed for this type of application (try contacting www.rocol.com for a sample). *Kilopoise 0868GW* is a "white, high viscosity (220kcp) synthetic hydrocarbon paste, thickened with micronised polyethylene" - sounds impressive and it works a treat.

The alignment method is very straightforward and that given in the manual was adhered to without any modifications (the procedure was described in Part 1 of this article). No problems were encountered and all transformers, coils and trimmers peaked as they should. Sensitivity and tuning scale accuracy is now excellent on all bands, with good cross modulation and image performance considering this is a single-conversion receiver with a low IF frequency. I put this down to a well designed and constructed RF section.



A Case History

As I noted above, the S.940 arrived in my shack without a case. I deliberated on whether to make one out of Perspex (otherwise known as acrylic or 'Plexiglas') as I did for my S.750 (photo, right). In the end I decided that I wanted a steel case for the S.940, 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. Now, 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 for a one-off). Although this is probably reasonable, given the amount of work involved, I decided that



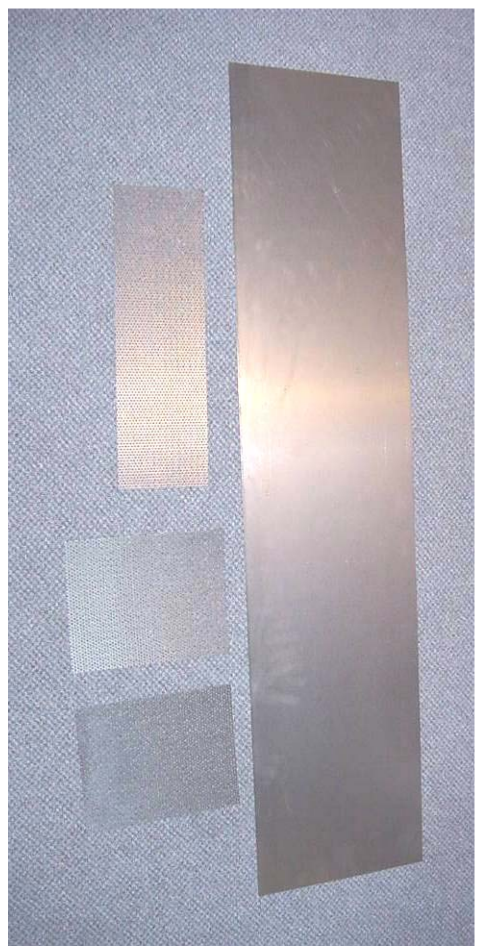
Above: rear view of my S.750 with its Perspex case – a practical solution and quite a talking point with its nickel-plated chassis, but perhaps not for the more, er, 'workaday' appearance of the S.940 chassis…

this was a bit too much to pay, as a working S.940 complete 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 of 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 and his MIG spot-welding kit, so, step by step, here is how to fabricate a functional, if not an exact reproduction 'MkII' or Alan Clayton style 'E' Eddystone case from scratch (or at least one way…).

Above: the S.940 now working off its own power but still no case. Ok, lets see what we can do…

- Decide on the case design: I opted to base the design on the original ('prototype') but to simplify it somewhat, considering that to 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 a 0.5" allowance for the overlap) x 11.75".
  - 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 (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) – as this would simply be the exposed rear chassis of the receiver 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 dimensions for this piece of perforated steel are 17.5" x 5.5" (including 0.5" 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 0.5" on each dimension for overlap and spot-welding.
- four ready-made steel angle brackets: two supporting the lower edge of the perforated rear panel 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 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.

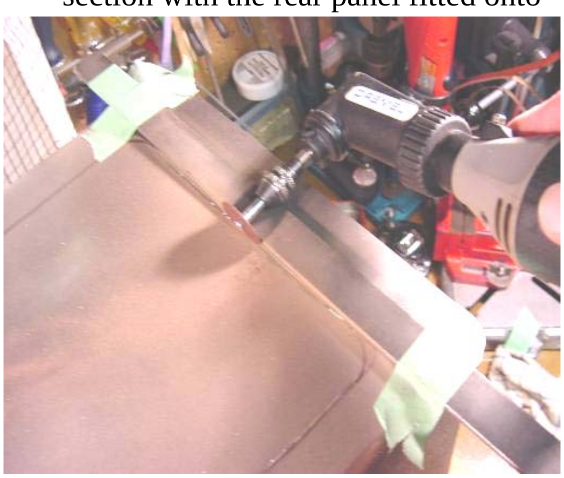
Above: the wrap-around piece of plain steel for the top, sides and base of the case marked ready for bending. Left: If you have access to one, use a proper 'bending brake', otherwise (like me) make a simple bending jig using wood and G-clamps: the corner of one piece of 2"x4" is shaped to the desired inside radius of the bends. Below: the completed wrap-around case being test-fitted to the S.940 – a little fine tuning needed, but not a bad fit for hand tools.

- Carefully mark the solid steel panel along the four corner bend points, taking care to make these at right-angles to the edges.
- Bend each of the two upper corners first along a suitable radius form and repeat

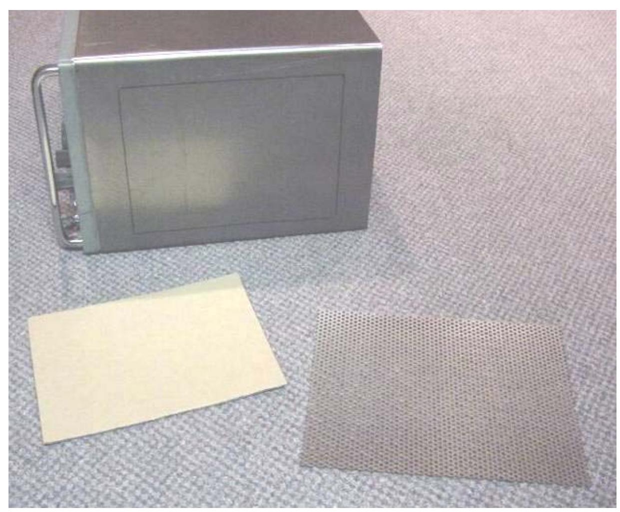
this operation for each of the two lower corner bends.

- Check the fit of the wrap-around section onto the receiver chassis/front panel rebate, adjust if necessary and mark the joining edge for best fit.
- Join the two ends of the wrap-around case section along the rebate by spot-welding.
- Bend the ends and top of the upper rear panel section perforated steel to form the angle returns to fit inside the wrap-around case section.
- Install the rear panel into the wrap-around case section.

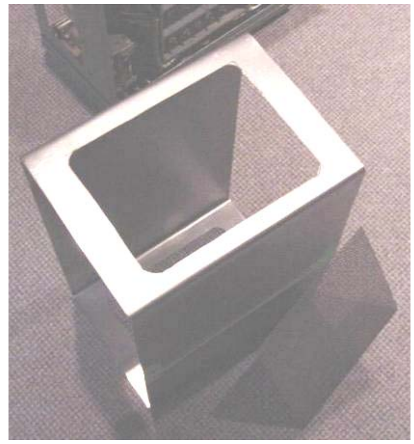
- Check the fit of the wrap-around case section with the rear panel fitted onto the receiver chassis/front panel rebate and adjust if necessary for best fit.



Above: the S.940 with the wrap-around case section fitted and the rear perforated panel being marked-up for bending. Top left: the rear panel having its ends and upper edge bent to form the angle return to fit inside the wrap-around section. Below: cardboard template for marking the side panel cut-outs for the perforated steel ventilation panels. Bottom left: using a Dremel to make the side panel cut-outs using a steel bar as a guide.



- 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 the local DIY store (two large, two small): the two larger ones to brace the rear panel and provide handles to facilitate removal of the case and the two smaller ones to form the lower thumbscrew mounts. Locate these in the case, check the 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 (see photo on previous page).

- Cut the side panel cut-outs using a Dremel (high-speed rotary tool) or similar, file/grind the edges smooth.
- Spot-weld the two 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.

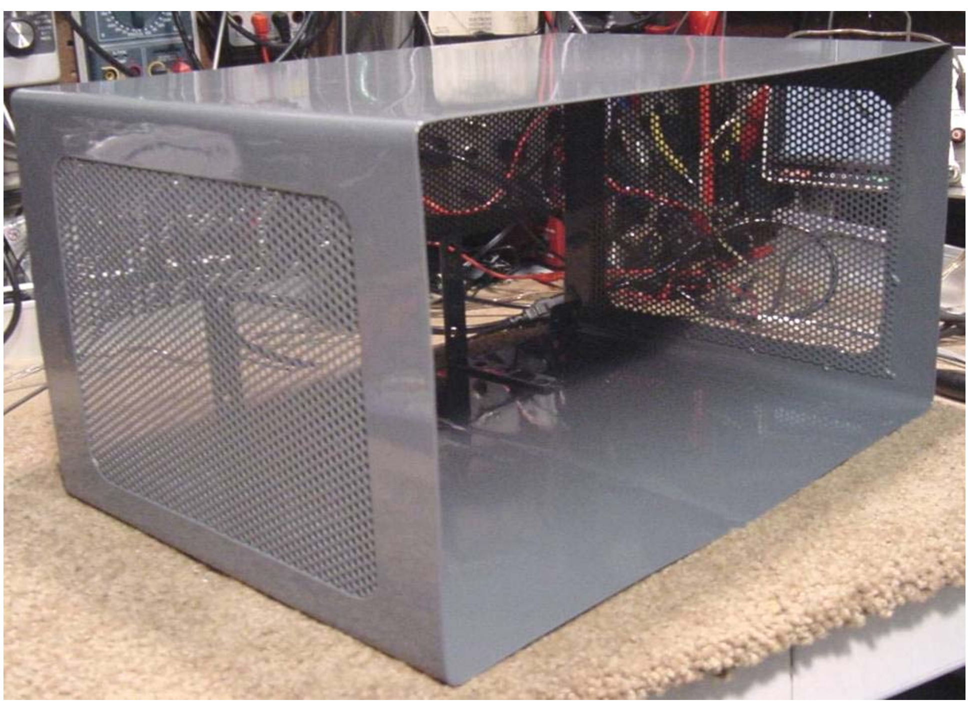
- Install four stick-on rubber feet onto the four corners of the case bottom.
- Run a length of insulating tape along the inside of the case, in a line above the three dial lamp holders – a precaution as these have a habit of shorting to the case over time.
- Fit the completed case to the receiver chassis.
- 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 (see the illustration from the September, 1967 Eddystone S.940 'Spec Sheet' on the page 17), 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

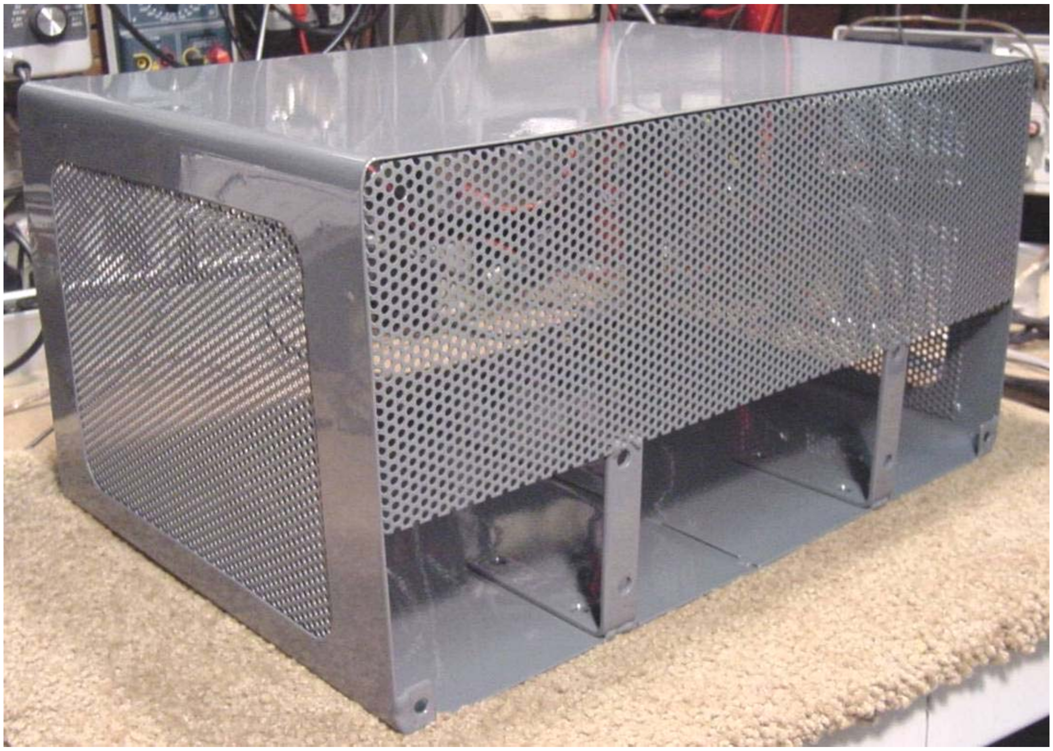
Top: non-standard rear panel with 'easy-pull' handles, facilitating case removal. Left: underneath view before powder coating. Above right: lower thumbscrew bracket.

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 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). 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.

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.



Left: the case now powder coated and ready for the S.940



Above/below: rear views of the case with and without the chassis fitted. The colour is called 'Iron Grey' and is the darkest the powder coat shop stocked (it is perhaps a tad on the light side for the purist but looks fine and contrasts ok with the front panel colour).

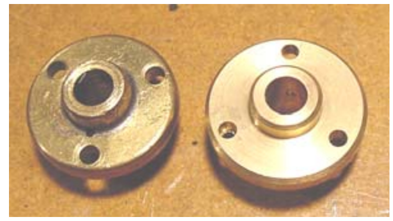
Conclusion

Once again, a so-called 'parts set' Eddystone has been made into a fully-functional receiver with excellent performance, good looks and that desirable 'Eddystone feel'. It takes some

thought, quite a bit of patience, a few dollars and a lot of TLC… otherwise its easy – and fun. Have a go at restoring a 'parts set' near you, enjoy doing it and then using it! – and don't forget to write it up as an article to help and inspire others to do the same – please.

73's

Postscript 1



The replacement brass tuning shaft bush - actually a replica - eventually arrived (the one on the right in photo, right). It

needed the angled lubrication hole to be drilled (photo, left) but otherwise it is a very good copy of the original, and it was soon lubricated with some moly grease and fitted in place of the existing worn part (photo, right). What a difference to the feel of the tuning control – now smooth as silk with no 'rattle' when the tuning knob is spun….. smoooooooth – at long last!

Postscript 2

A new S.750 faceplate and some Eddystone badges were subsequently purchased from Ian Nutt and provided *gratis* to Pat as a 'thank you' for giving me the S.940 'parts set', supplying a coil unit and helping with the case construction (Pat is restoring an S.750 at the moment – good luck with the restoration efforts!!).

References

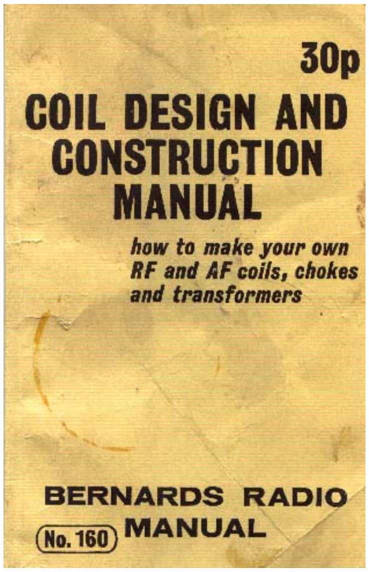
Part 1 of this article included extensive references from 'Lighthouse' and other

publications and these are therefore not repeated here, however, the following additional reference was used to design the replacement Band 4 aerial coil:

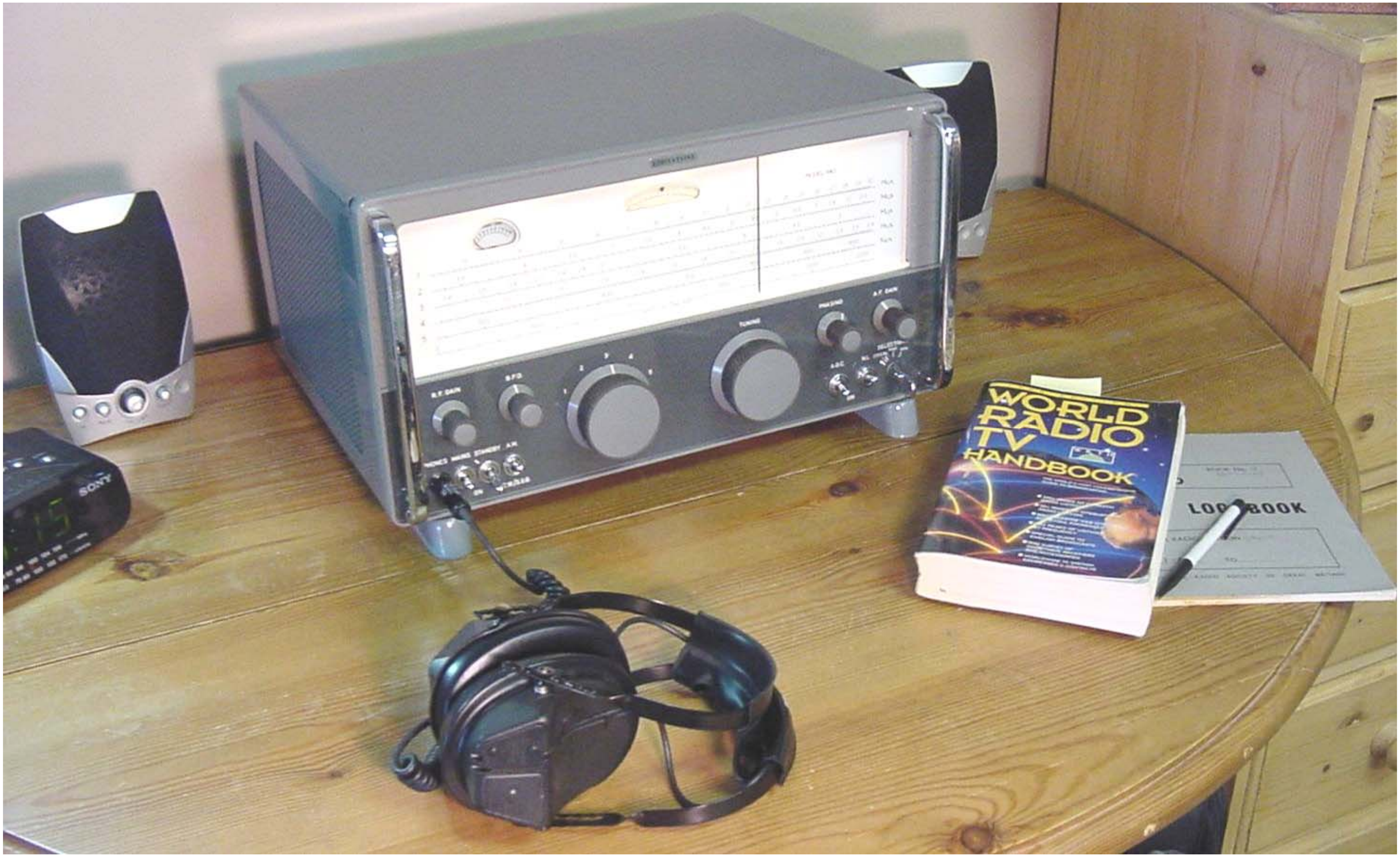
- Coil Design and Construction Manual, Bernard's Radio Manual #160, 1960, Edited by (Sir) Clive Sinclair, Ch. 2.
- Coil Design Spreadsheet (download from EUG site) simplifying some of the coil design calculations found in the above Manual.

See also:

- http://www.rac.ca/tca/RF_Coil_Design.html
- http://www.captain.at/electronics/coils/
- http://www.qsl.net/eddystone/



Above right: Sir Clive Sinclair-edited book on coil design (looking a bit worse for wear). Below: detail of the S.940 case side ventilation panel. Above left: yours truly (also looking a bit worse for wear) taking a break while the case was being powder coated – here on the beach at Semiahmoo Resort in Washington State, USA. Of course I returned with several 'vintage' radios to restore - alas, all non-Eddystone…..



Now its finally time for a bit of DX’ing - note the ‘chocks’ (aka ‘Mounting Blocks’) made from door stops and the Sonetronics 600 ohm ‘comms’ headset (these are excellent for extended use – SG Brown-like performance without giving you cauliflower ears).

RF Inductance Design Sheet

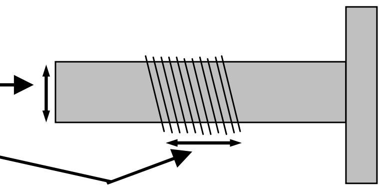
Tuned Circuit Inductance Calculator (Chapman)

Highest tuned frequency? (MHz)	2.400	125.00 = Metres	125.00	2.400 = MHz
Lowest tuned frequency? (MHz)	1.030	291.26 = Metres	291.26	1.030 = MHz
Tuning capacitor span? (pf)	366			
Calculated Inductance (uH)		53		

SWG	Enamel TPI	TPSI
16	14.8	219
18	19.6	383
20	26	675
22	33	1090
24	41.5	1720
26	50	2500
28	61	3700
30	73	5300
32	83	6900
34	97	9400
36	116	13400
38	145	21000
40	178	31500
42	208	43000
44	255	71000
46	330	110000

Formula For Coils (Wheeler)

Outside Diameter (")	0.4
Length of winding (")	0.625
Required Inductance L (uH)	53
Calculated number of turns	92
Calculated pitch (tpi)	146



Bank Wound Coils (Blakey)

Mean Diameter a (")	0.5
Winding Length b (")	0.1
Radial Depth c (")	0.06
Required Inductance (uH)	53
Calculated number of turns	56
Calculated turns per sq inch	15664

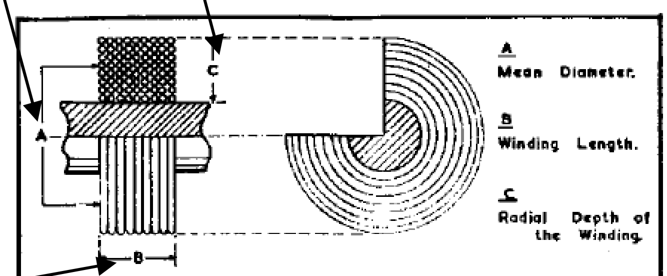


Fig. 5. Bank Wound Coil Dimensions.