Restoration of an Eddystone S.680/2 – the late-1940's Eddystone 'Hottie' (but, thankfully, not quite as hottie as the original S.680…), Part 1, by Gerry O'Hara, G8GUH/VE7GUH

Background

Back in April, 2007 I had the opportunity to restore an Eddystone S.680X on behalf of the SPARC museum in Coquitlam, BC, Canada. I was most impressed by that receiver – both in terms of build quality and performance – and it was a particularly nice example. The S.680 series and its military cousin, the S.730/4, were stalwarts of the high-end general coverage receivers manufactured in the UK in the decade or so after WWII. My article on the S.680X restoration is posted to the EUG website for anyone interested in that model. The S.680/2 (aka the S.680) is the forerunner of the S.680X and the tale of woe leading to its manufacture provided in the earlier article is repeated here – with a few added nuances for completeness.

"The company was without a good professional HF receiver, the S.504 having flopped, and Harold Cox was eager to get things moving. He specified that it should use the new B7G miniature valves, be fitted into the 640 cabinet and use the same mains transformer (we had loads in stock!).

"If you look at the Radiolympia report in the Wireless World for October 1947 you'll see a photo of the new S.680. But it's smaller than the 680 which was finally released two years later! The problem was heat . . . too much of it.

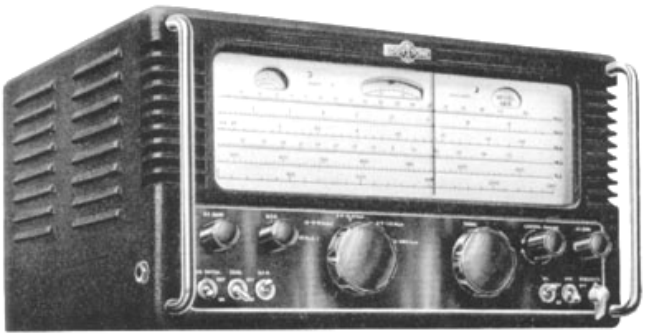
"The 640 transformer was pushing it to start with and the extra load of the 680 caused it to burst into flames when left permanently operational in high ambient temperatures. Not exactly the sort of reliability which Stratton were seeking to promote.

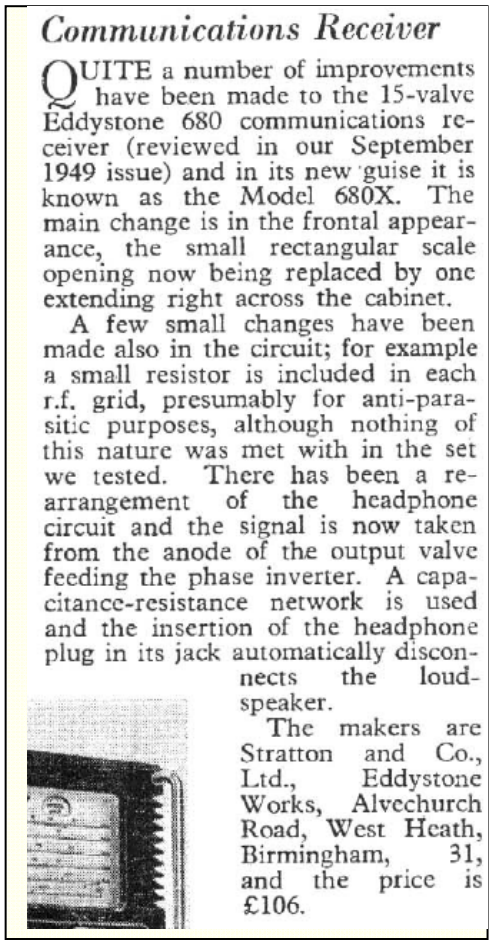
"After a major re-design the 680 and its slide-rule dial version, the 680X, became one of our best-sellers of the 'fifties. And this in spite of having a price-tag that was the deposit on a small car!

Above: excerpt from the 'Cooke Report' by Bill Cooke, recalling the development problems with Eddystone's 'hottest' post war receiver… Above left: the S.680, aka S.680/2. Top of next page, the S.680X. Spot the difference?

The Eddystone S.680 series apparently did not get off to the best of starts. Exhibited at the 1947 Radiolympia Show, it was announced as the successor to the immediate post-war (and not very successful) S.504, itself building on the S.358X of the war years (see restoration article on an S.358X also posted to the EUG website), but having a switched internal coilpack instead of the plug-in coils of the S.358X. The S.680 used the same sized cabinet and transformer as the contemporary S.640 (a 9 octal valve set aimed at the amateur market), and due to the larger dissipation of the additional valves (total 15), albeit all miniature types except for the rectifier, voltage stabilizer and in some sets, the mixer, the set ran a tad on the hot side (see excerpt from the 'Cooke Report', above right). That version of the S.680 therefore did not see the production line proper and it was not until 1949 that it appeared again as the 'New 680', aka the S.680/2, though marketed as simply the 'S.680' from 1949 to 1951, a rather

short production life for an Eddystone model. The shortcomings of the earlier design had been resolved by a larger power transformer and installing the set in a larger and better-ventilated cabinet – though still sporting a 'half-moon' dial (rendering on previous page) and with 15 valves in a two RF, two IF single conversion circuit with plenty of 'bells and whistles' such as a crystal filter, variable selectivity, noise limiter, S-meter and a push-pull audio output stage: all-in-all, quite a serious communications receiver. As noted above, the successor to this model was the S.680X, rendering, above right (the 'X' suffix reportedly being considered as adding a touch of 'mystery' by Harold Cox, Technical Manager and later Technical Director of Eddystone, and not an indication that the set had a crystal filter, which the S.680/2 had anyway).





Communications Receiver

QUITE a number of improvements have been made to the 15-valve Eddystone 680 communications receiver (reviewed in our September 1949 issue) and in its new guise it is known as the Model 680X. The main change is in the frontal appearance, the small rectangular scale opening now being replaced by one extending right across the cabinet.

A few small changes have been made also in the circuit; for example a small resistor is included in each r.f. grid, presumably for anti-parasitic purposes, although nothing of this nature was met with in the set we tested. There has been a rearrangement of the headphone circuit and the signal is now taken from the anode of the output valve feeding the phase inverter. A capacitance-resistance network is used and the insertion of the headphone plug in its jack automatically disconnects the loudspeaker.

The makers are Stratton and Co., Ltd., Eddystone Works, Alvechurch Road, West Heath, Birmingham, 31, and the price is £106.

The S.680X had a ten year production life, from 1951 to 1961, during which time some 1,562 sets were produced. The main 'cosmetic' difference between this model and the earlier S.680/2 was the front panel, which now sported the 'signature' Eddystone sliderule dial which gave 32 feet of tuning bandspread, compared with only 7.5 feet on the S.680/2 'half mooner'. Electrically, the sets were almost identical, with the exception of the frequency changer (mixer) valve, this being a (Loktal) 7S7 (X81) in the S.680/2 and a 6BE6 in the S.680X (though some S.680/2's were reportedly fitted with a 6BE6 with some circuit modifications to the mixer – schematic in the S.680/2 manual and in Molloy & Poole), the 6AU6 first audio/phase-splitter valves in the S.680/2 replaced by 6BR7's (8D5) in the S.680X, and a few passive component changes, eg. insertion of 12 ohm grid stopper resistors in the RF, mixer and first IF stages in the S.680X to mitigate potential for parasitic oscillation, and a revised 'phones circuit. Some other minor modifications found in later models were associated with providing gain compensation with varying selectivity. The S.680/2 is listed in the QRG as being 'rare', which is reasonable given its short production lift of 1949 through 1951 when the S.680X was introduced. The S.680X is listed as 'common', with a production run of 1562 in the period 1951 to 1961 (less than 160 sets per year). The QRG does not list the number of S.680/2's produced, but given the austere immediate post-war years and it being a new (and expensive) model on the market, the production rate was likely no more than 100 per annum (my set is number 92 for the 1949 production run), so say 300 sets altogether, but probably less than this.

The S.680 series covers 480KHz to 30MHz in 5 bands:

Band 1	..	30	Mc/s. to	12·3	Mc/s.
Band 2	..	12·5	Mc/s. to	5·3	Mc/s.
Band 3	..	5·7	Mc/s. to	2·5	Mc/s.
Band 4	..	2·5	Mc/s. to	1·11	Mc/s.
Band 5	..	1120	kc/s. to	480	kc/s.

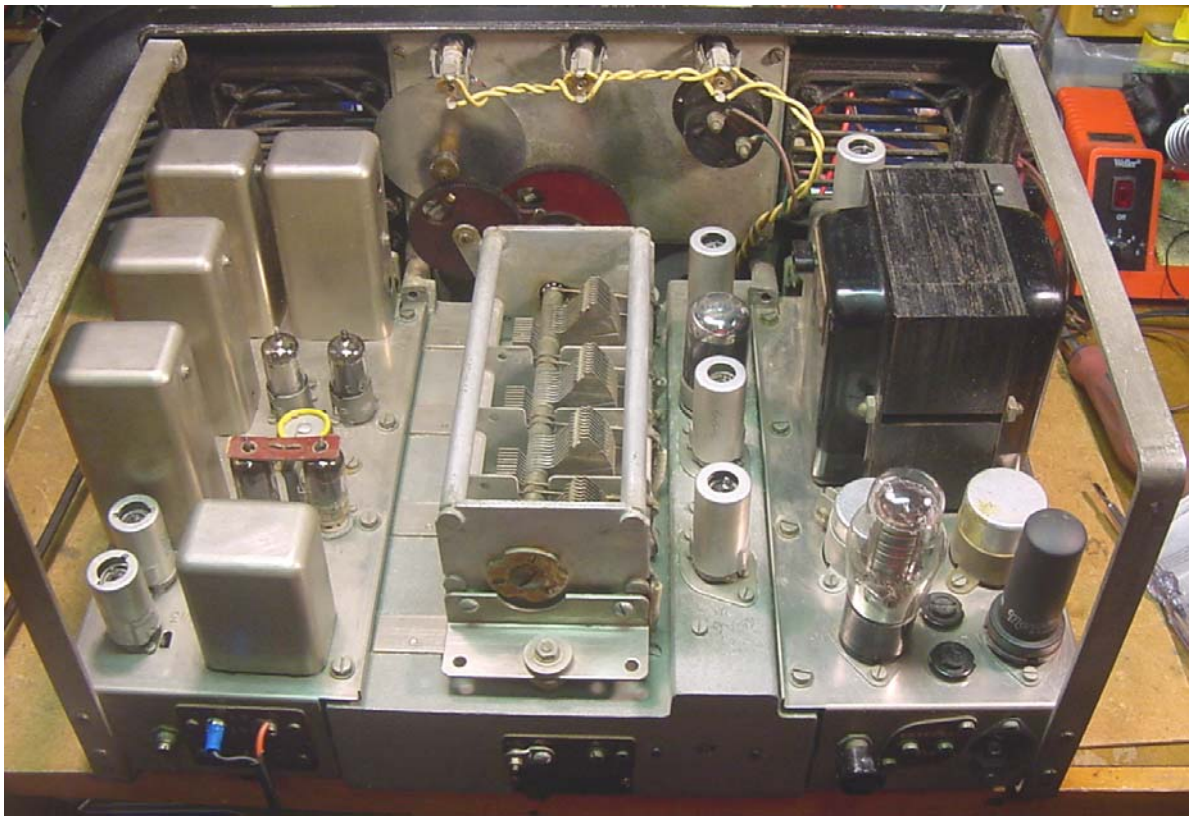
So, after me coveting the SPARC museums S.680X for the past three years or so (boy, was I reluctant to return that set to the museum display!), how did I finally come by an S680 series set here in Canada? Well, it is a long story – literally. Early in the New Year (2010) I received an email from a radio amateur 'back east' advising that there was soon to be a 'silent key' sale in Montreal and that my name had come up as someone that may be interested in any Eddystone sets or accessories in the collection. A list of receivers and other radio paraphernalia subsequently arrived, which listed the S.680/2, an S.750 and a couple of S.958/3s amongst an eclectic list of other receivers and assorted radio paraphernalia, including RACAL and Collins sets. Silent key sales can be difficult and can take time to organize and undertake for those concerned – being sympathetic to the family situation being paramount. However, correspondence over the following weeks and months eventually resulted in the S.750 being purchased by a friend at the SPARC museum and the S.680/2 by myself, along with matching speaker (model 688) and an S-Meter (model 669), the latter for my S.750 (I had been after the speaker and S-Meter for years also! – I cannot remember the number of times I bid on these items on Ebay). I could tell from the photos sent to me that the S.680/2 was not in all-original condition – the most obvious cosmetic detractions being that the fingerplate had been stripped, re-pained and white 'Letraset' applied during an earlier 'spruce-up' by someone, and the four smaller knobs were non-Eddystone types (photo, above).

I would also note here that the SPARC museum's S.680X, S/N *GJ1318* hails from July, 1958, whereas my S.680/2, S/N *FA0092* was manufactured in August, 1949, so almost 9 years difference in production dates. However, the similarity of the circuitry and many components is striking – indeed I think the front panel from one set could almost be

grafted onto the chassis of the other to give you whichever set you desired[1]… some comparison photos are provided later in this article – you will see what I mean.

Preliminary Inspection and Safety Checks

The S.680/2 duly arrived, well-packed and in a separate box to the S-Meter and speaker. The S-Meter was in almost mint condition and, following a squirt of De-Oxit into the pot worked perfectly when plugged into either my S.740 or S.750 receivers. The speaker was also in excellent working condition, with only a few very minor chips in the black wrinkle finish – soon touched-up to invisibility with a black permanent marker.

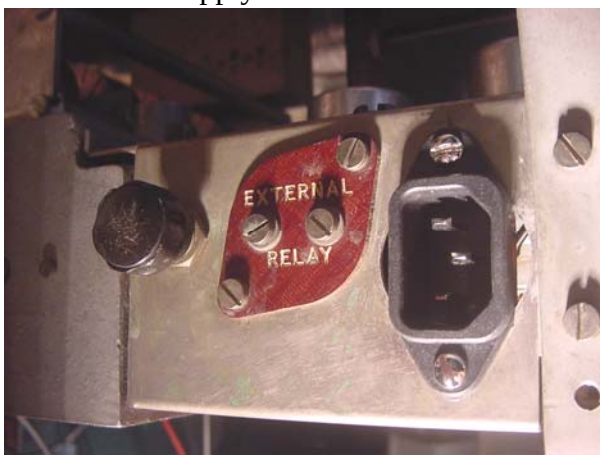


The S.680/2 was in fairly clean condition and was working on arrival (photos above), confirming my thoughts that someone had given the set some 'TLC' (and use) at some

[1] Not quite – there is an offset on the main tuning gang. See photos towards the end of this article

point in the past few years. Unfortunately, the TLC, while well-intended and which made for a clean (and working) set, detracted from its authenticity somewhat: the re-worked fingerplate was the most obvious problem (not something Ian Nutt would likely carry for such a rare set), the knobs less-so, as replacements can be found for these. On opening-up the lid on the case a repair carried out in the past posed another challenge to rendering the set authentic – the HT smoothing choke had been replaced by a larger unit of Marconi manufacture (photo, right), the original shroud, which matches the BFO unit and AF output transformer, having been discarded by the person doing the repair.

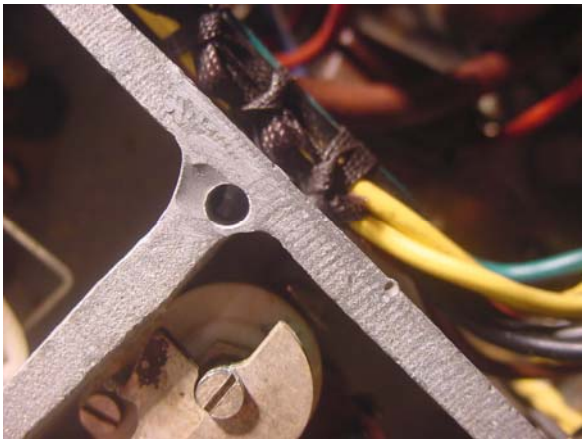
Off came the case and a closer inspection of the chassis got underway. The next thing I noticed was the mains power connector was non-standard – the one fitted being a rather cheap-looking two-pin round affair manufactured in the USA and that mated with North American flat 2 pin sockets (photo, left). The power cord that came with the set was fitted with a socket (which was designed for chassis-mounting), its connections with the cord being insulated with shrink-wrap – fairly safe but not acceptable to me – I decided to retro-fit an IEC chassis plug (I have a supply of them retrieved from old computer power supplies). This was a simple enough job as the round connector was fitted into a large round hole cut into the chassis – the IEC connector almost filled the hole and slots that had been cut into the chassis already for the old connector fit the mounting holes for the IEC connector – no further butchering of the chassis was needed. A small gap was left either side of the IEC socket, but I can live with that. In common with several Eddystone models of this period, both sides of the mains supply are fused. While I was at it, I decided to make a wiring change in the power supply (in the interests of transformer preservation) and use one of the chassis-mounted fuses in the HT supply (between the transformer HT secondary tap to ground) – a mod that is easily reversed should anyone be so inclined. I also noted that the two main HT filter capacitors had been changed-out at sometime – however, the replacements were can-types (though non-matching) and looked ok from above the chassis.



Initial Clean-up and Power-on

By this stage all valves had been removed during preliminary inspection of the chassis, so I installed the rectifier only and checked the supply was working ok – correct voltages, nothing overheating - it was fine (the seller had advised me the set was working). Before I tried the set properly, I decided to clean the chassis up a bit more – though to be honest it was reasonably clean to start with. I used a paintbrush and vacuum cleaner to remove loose dust and debris (above and below the chassis) and then wiped the chassis over with a cloth moistened in warm soapy water, using alcohol or lighter-fluid moistened Q-Tips where there was a build-up of more stubborn/greasy grime. The nickel-plated AF/power supply and AF/IF sub-chassis came up very nicely. The aluminium casting for the coilbox is slightly corroded (the set was maybe stored in damp conditions sometime) with white oxidization in places and with a generally rough, unfinished appearance (more so than in more recent Eddystone sets in my collection – maybe Eddystone finished them off better in later years?). I cleaned off the white oxidation and buffed the surface a bit with an alcohol-soaked cloth, deciding not to attempt any further clean-up of this unit. One of the screw holes had been 'forced' by inserting a screw holding the cover plate onto the coilbox at sometime in the past – this had resulted in the corner of the casting being broken off. I repaired the break using 'JB-Weld' (photo below, right).

Unlike the S.680X I had restored for the SPARC museum (in which the power supply and IF/AF sub-chassis were finished in a grey enamel paint, as were all the IF transformers, crystal filter unit, BFO unit, tuning gang cover, power supply choke and AF output transformer shrouds), in this set these sub-chassis are unfinished nickel-plated brass with alloy transformer/choke and BFO unit shrouds that match the IF transformer cans (there is no tuning gang cover in the S680/2).



Time for more power-on checks:

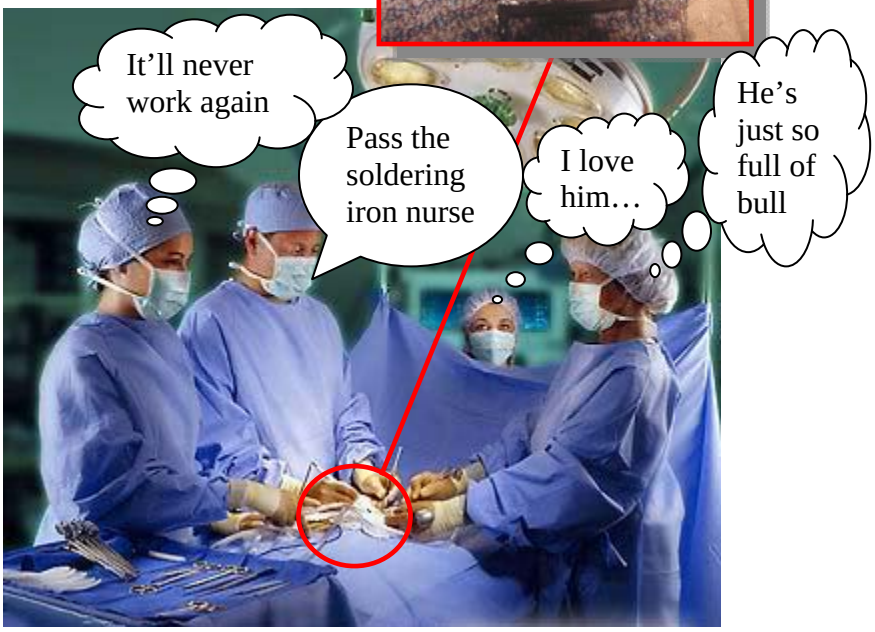
- I cleaned and checked all the valves on my Precision valve tester – they all tested ok;
- Checked the resistance measurement from HT to chassis – looked good, rising to around 50k ohms on the meter as the smoothing capacitors charged up.
- The power supply had already been checked, so next I undertook leakage checks on a few of the 'TCC' metal-can 0.01uf and 0.1uf paper HT and screen by-pass capacitors, low-voltage electrolytic cathode by-pass capacitors and AGC line capacitors – those tested ok, so I decided to power-up the set again without replacing any;
- I re-installed the remaining valves and attached a speaker. With power applied I checked the HT current draw (newly-installed HT fuse in the transformer HT centre-tap chassis temporarily removed and bridged with a milliameter) - about 105mA draw (the manual says 110mA) – seemed ok;

- Noise was emanating from the speaker and stations tuned in well on all bands – looking promising…
- I checked a few voltages in the set and noted the 150v stabilized HT supply was at 160v and varying randomly by up to 8 volts. I replaced the VR150/30 with a new one and that fixed the stabilized HT voltage at 150v.

Repairs, Transplants and Substitutions

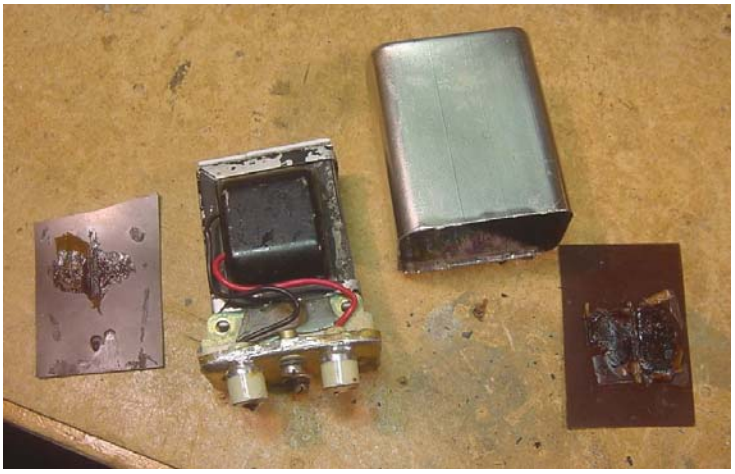
- Well, whist the Marconi-manufactured power supply choke worked fine, it did not look the part at all - yes, ok, it had a black wrinkle finish, and I guess years later Eddystone would be part of Marconi, but… it had to go. Pat checked his 'parts S.750' and found that although its power supply smoothing choke was missing, the AF output transformer was present and the shroud on that matched the one from the missing choke (I checked in the SPARC Museum's S.680X to make sure). So, would a transplant be possible? – maybe if I could find a suitable choke that would fit the AF transformer shroud. Amazingly, a suitable choke was supplied by another Eddystone collector at the SPARC museum – thanks Brian! (there are three of us 'infected' members) – this choke was not an Eddystone part, but one that would at least fit into the shroud. Its inductance measured just over 2H, had a resistance of 180 ohms and a purported current rating of 100mA. Having no idea if a 2H choke would be ok (seemed a bit on the low side), I disconnected the Marconi choke, which measured over 20H with resistance of 420 ohms), and temporarily substituted the small 2H one – the set worked fine: no discernable increase in hum and the voltages were still within tolerance of those stipulated in the manual.

- So the next job was to undertake the transplant (I was feeling a bit cocky as I had just finished reading 'Every Second Counts' while I was on vacation – a quite fascinating story about how the first human heart transplant came to be back in 1967. There are some good side-stories in that book, eg. did you know the first pacemaker was made by a surgeon that bought the bits from a shop in Canal street in New York and used a circuit for a metronome from *Radio-*



Electronics magazine?). My transplant was not quite in the same league, but at least my patient has lived longer than eighteen days…

- I had some experience of taking one of these shrouds apart before – I had repaired an open circuit in the choke in the SPARC Museum's S.750 (did you know that Dr. Barnard stitched an extra head on a dog as his practice party piece). The base of the assembly is soldered onto the main shroud body. Rather than overheat the assembly, I found it better to cut the soldered joint using a knife (with great care!) and then gently pry apart using a small chisel/wide screwdriver blade, taking pains not to damage/distort the shroud. I repeated this 'procedure' on the S.750 AF output transformer (hey, I even have the right medical terminology…). After 5 minutes work I had the base of the unit off and was able to remove the transformer – cutting the leads at the point of connection with the terminal posts and undoing the two 6BA screws that held it in place on a bracket fixed to the base. I left the Paxolin insulating plates in the shroud and tried the 2H choke in the shroud – it fitted easily. I removed two of the terminal posts from the transformer base (the choke only has two connections and the chassis was punched for these, not four as on the transformer). I used double-sided sticky pads and a piece of dense insulating foam to mount the choke onto the base, and some of the sticky pads (with the sticky side exposed on one side only) to act as padding above and to one side of the choke. I then soldered the chokes leads to the two terminal posts (photo, above) and then slid the choke into the shroud, spot-soldering the base of the can back in place (photo, left) after testing for continuity between the terminal posts.

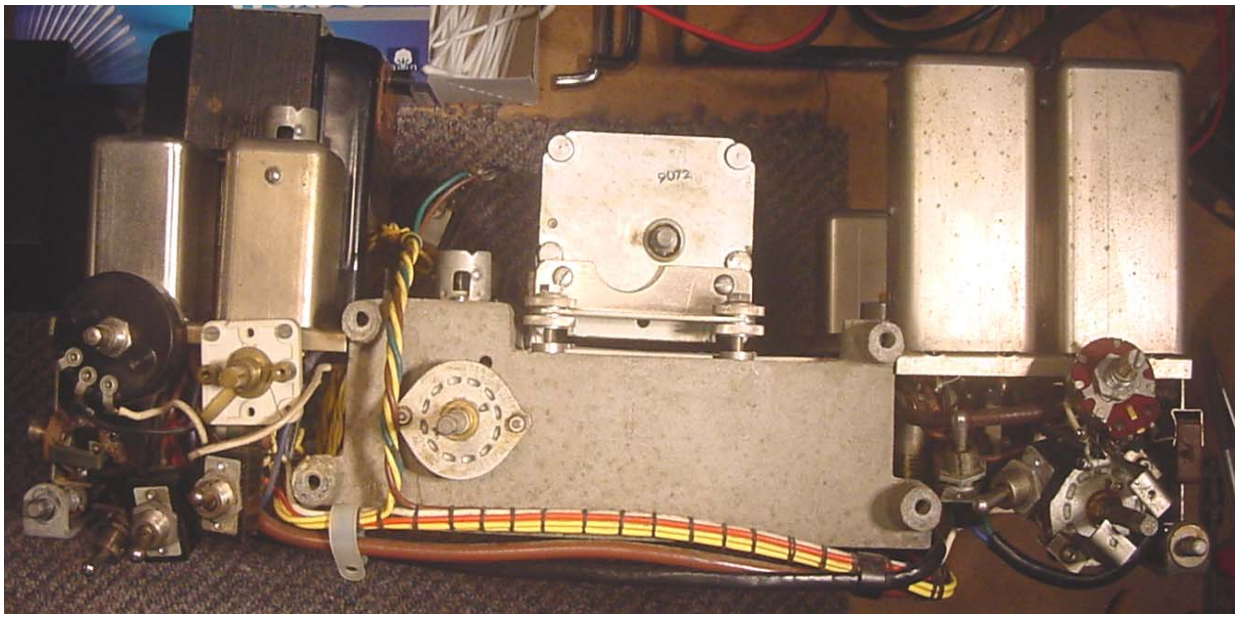


- The choke assembly was then fitted to the chassis in place of the Marconi unit – looks just like the original must have (photo, right). I left the receiver on soak test for several hours over a few evenings and the choke shroud was getting only mildly warm, the set working well. Job done – thanks for

the inspiration Dr. Barnard – and not a dog's head wasted.
- Time to work on the sets cosmetics…

Cosmetic Restoration

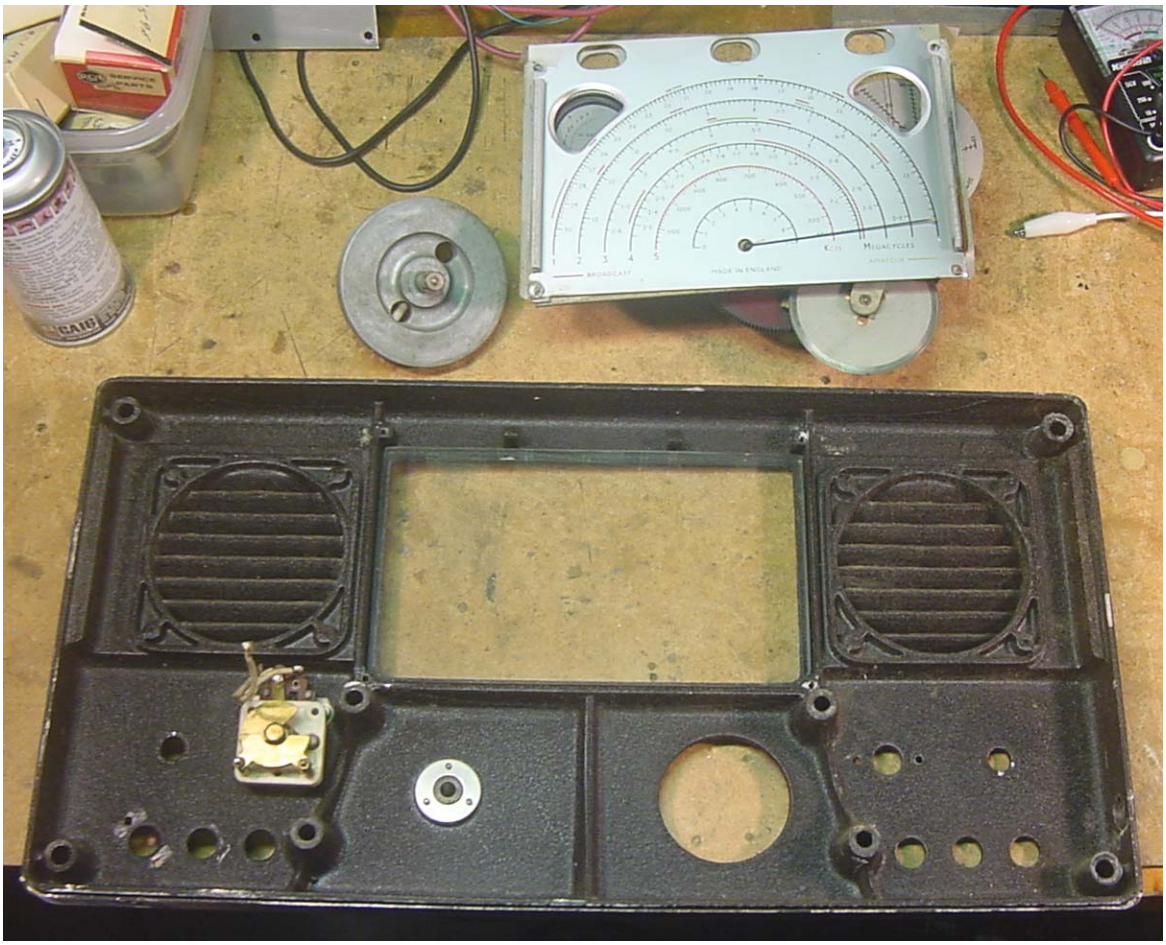
- The choke transplant was the first cosmetic improvement. This was followed by a second, more painstaking and detailed clean-up of the chassis using Q-Tips, alcohol and lighter fluid as appropriate – after this the chassis wiring was also cleaned using alcohol.
- Next I examined the case and front panel again. The case paintwork was very tatty on the top and rear, worn almost smooth, however, the sides and base looked fairly clean with a good wrinkle finish.



- I decided to remove the front panel and clean-up the scale, S-Meter, controls and the front panel itself. Removal of the front panel is fairly straightforward for the S.680/2:
  - Remove knobs;
  - Remove fingerplate;
  - Undo the S-Meter connections;
  - Loosen the two rear grubscrews on the tuning shaft coupler;
  - Disconnect connections (white wires) to the crystal phasing variable capacitor and crystal in/out switch (the panel can then be removed/replaced with these items still in place – the switch is mounted with 6BA screws, the nuts for which cannot be accessed easily otherwise);
  - Remove the four 2BA screws that secure the handles (note whether washers are in place between the brackets and the front panel – if present retain and re-install on re-assembly)
  - Remove the four 0BA screws that secure the front panel to the coil box casting

  - Pull the front panel, complete with gearbox and crystal phasing variable capacitor and crystal in/out switch away from the chassis.

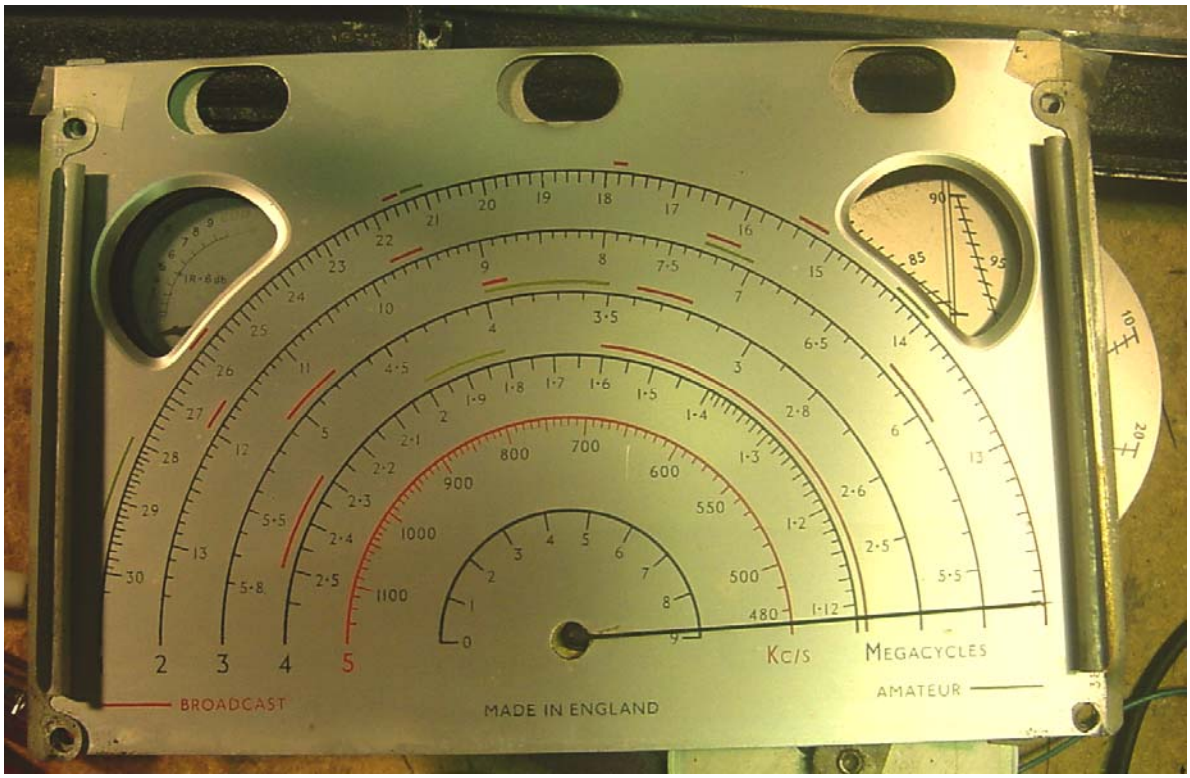
- The scale and gearbox assembly can then be removed from the rear of the front panel by removing the four 4BA screws holding it in place. Take care when removing the thick dial glass and spacers in front of and behind the scale.



- The S-Meter in my set had some black specks of dirt/paint flecks on the inside of the glass, so the meter was disassembled and the specs removed, the meter glass was cleaned inside and out with anti-static glass cleaner and the meter re-assembled (photo, right).

- The scale itself was dusted with a soft paintbrush and very carefully wiped clean with cotton wool soaked in lukewarm soapy water. The logging scale was inspected but appeared to be finished in a water-soluble fixative, so it was just brushed clean.
- The gearbox, comprising a mix of brass and Paxolin gears, had the usually well-intentioned liberal coating of oily grease build-up. This was carefully removed using Q-Tips, a needle and lighter fluid for the more stubborn deposits. The

gears were then given a very light coat of moly grease and each of the bearings a small drop of high-grade light machine oil. The tuning shaft bush was removed from the front panel and cleaned and given a light coating of moly grease ready for reinstallation.



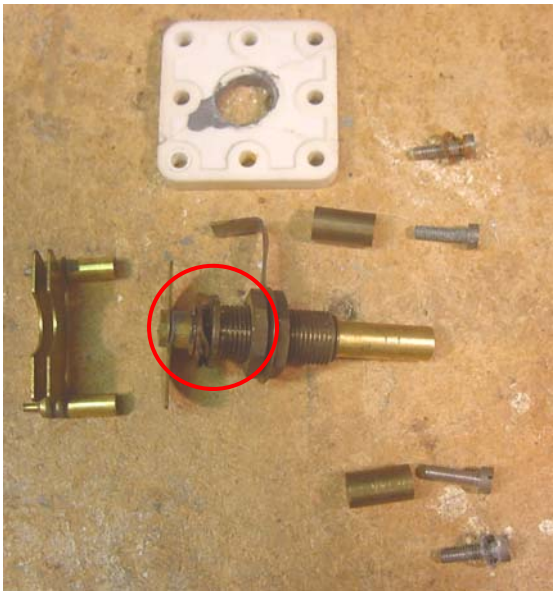
- While the front panel casting is off the set, use the great access this provides to clean up the front panel switches, variable capacitors (BFO and crystal phasing) and Yaxley switch mechanisms – also apply a little De-Oxit (or Servisol/Electrolube cleaner) on contact surfaces and into the AF and RF gain pots. While you are at it, clean the main tuning gang rotor connections, applying a little De-Oxit to the contact points and a dab of moly grease into the roller bearings;

- While cleaning the now bare front panel I noted that the finish was blistering in the louvered areas (photo, right) and was coming away from the aluminium in other areas – it had been re-painted with a black wrinkle finish at some point in its life. That decided it – I would have the case and front panel both sandblasted and re-finished with a black wrinkle powder coat – this would mean a bit of a hiatus in the restoration process… but well-worth the effort.
- The BFO tuning capacitor had fallen apart when I was removing it from the front panel – I had previously noticed a crack in the ceramic plate

but had not realized just how badly it was damaged (photo, right). I think someone had tried to over-tighten the nut on the shaft collar in a misguided attempt to make the control action 'feel better' – it had a very loose feel. This over-tightening had cracked the ceramic. After removal from the set I repaired the ceramic plate with superglue on the clean breaks and with 'JB-Weld' in the areas where the ceramic had crumbled away – a bit of a fiddly job, but it worked.

The torque of the shaft was adjusted by careful adjustment of the spring/wiper located on the inside edge of the shaft collar (circled in photo, below) and the capacitor re-assembled and tested – works fine (note – be careful applying/using JB-Weld as it does conduct electricity albeit with a very high resistance).

- As it happened, after all this fiddling, it turned out that Pat's parts set (an S.750) had a suitable capacitor that could be used as a donor for the ceramic plate. So, I ended-up using the intact ceramic plate from the S.750 and the rest of the hardware from the capacitor in my set. The repaired ceramic plate was swapped-into the capacitor from the parts set – I am sure it will come in useful one day!

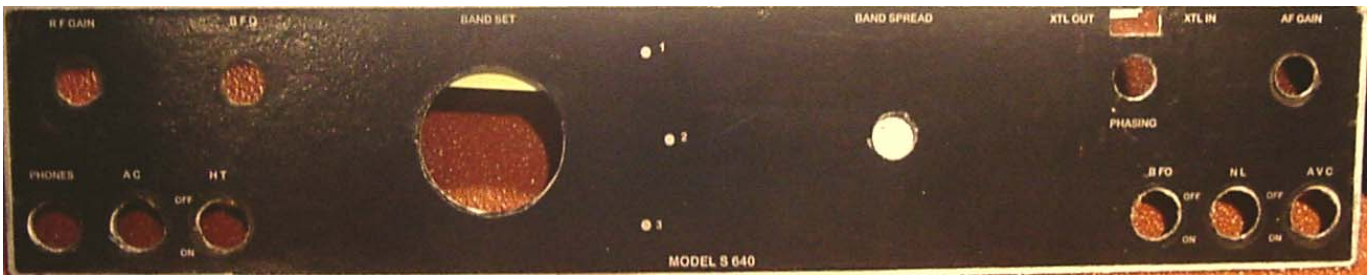


Fingerplate

As mentioned earlier in the article, the fingerplate on this set had been re-finished by a previous owner using white 'Letraset' lettering. The fingerplate is the most 'visible' part of the radio after the scale, so I needed to improve on this if a realistic restoration was to be had. Not being a whiz with drawing packages, I took the fingerplate in to work and had a chat with our chief drafting guy, George. A short while later he had re-drafted the artwork (see top of next page) and then all I had to do was transfer this to the fingerplate[2]… but how best to do this? (easier said than done).

[2] George used the 'Myriad Pro Light' font (a standard font in CorelDraw). It's not exactly the same font as Eddystone used in 1949 but is very close. The sizes used are 9.7 pt for majority of text, 8.3 pt for small text (ON, OFF, etc.) and 11 pt for numbers. While he was at it, he also drafted fingerplate artwork for the S.640 and S.750 (all very similar). The artwork is in Windows metafile format and will be posted on the EUG website. The files can be edited using the free design software 'Inkscape' (http://www.inkscape.org/)

I noted that in an article by Bryan Cauthery, VE3DFC on restoring his S.640 (Lighthouse Issue 70, page 32) he described how he did this (interestingly one of my Eddystone enthusiast friends at the SPARC museum has just bought this very set on Ebay). Bryan notes that he '…scanned the [finger] plate into the computer, cleaned up the worn letters and printed onto low gloss black background with silver lettering on white paper'. He then stuck this onto the fingerplate an gave it three coats of clearcoat lacquer, reporting that the results looked like new. Sounds simple but effective. Inspection of the (now 9 years old) fingerplate from Bryan's S.640 (photo below) shows a little wear – mainly scuffs where the switch retaining nuts have been tightened against it. However, I have no way of knowing how much use the set had since its restoration by Bryan back in 2001.



Potential methods I considered for finishing the S.680 fingerplate included:

- silkscreen (likely expensive for a commercial one-off, but worth checking-out anyway as this would have the most chance of looking like the original). Local sign makers looked the best-bet, although an art and craft chain store here in Canada sells silkscreen kits (really designed for clothing, but should work ok – though the box does not specifically list Eddystone fingerplates as a possibility!). However these kits are around $400, so a bit of an expensive experiment – see http://www.michaels.com/yudu if you are interested

- laser print onto reverse side of acetate sheet with lettering clear, then affix to bare metal fingerplate (or spray paint it silver first). Problem finding large-enough acetate sheet suitable for laser printing

- laser print onto decal paper with lettering clear and affix the decal onto the bare metal fingerplate. Problem finding large-enough decal paper

- professionally photo print onto semi-matte photo paper - I tried this (see below)

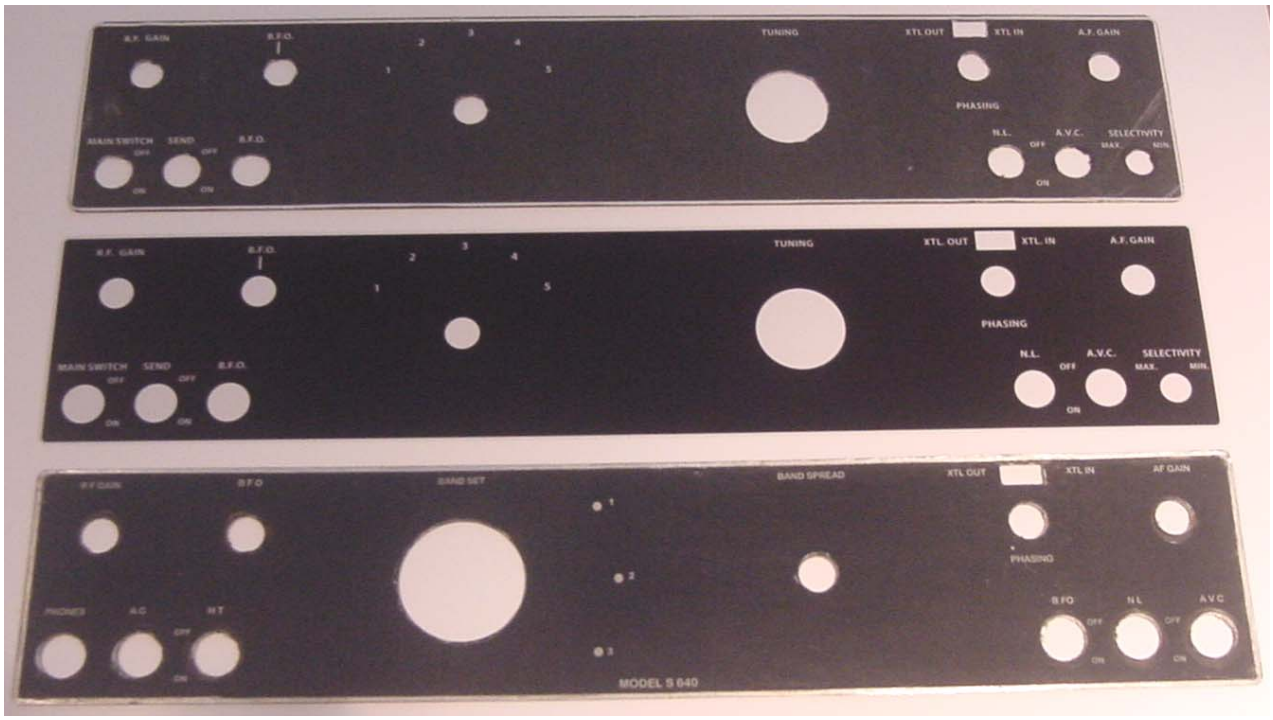
- laser print onto regular paper stock and affix a thin matte Perspex fingerplate over it (or laminate)

- colour laser print the lettering only onto decal paper (full fingerplate size) and affix to the metal fingerplate (pre-painted black)

- colour laser jet the lettering only onto decal paper and place the decal lettering onto the metal fingerplate that has been pre-painted black. Coats of fixative/matte lacquer or thin Perspex sheet could be applied for protection. Silver edging could be applied with paint/masked-off during application.

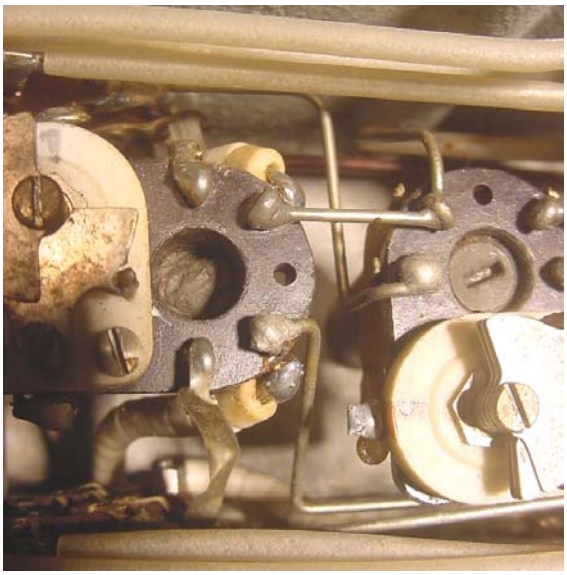
I decided to first make a 'mock-up' by simply printing the artwork onto standard weight paper on a laser printer. The lettering and line work was shaded light grey and although the 'black' was more of a dark charcoal-grey, the result was pretty good. Next I tried printing onto semi-matte photo paper. The result was a much 'deeper' black and more convincing silver tones, but it was slightly too shiny compared with a 'standard' original fingerplate (though the fingerplate on the S.680X I restored for the SPARC museum was a high-gloss finish). One suggestion I had was to have it single-side laminated with a matte-finish laminate. This would dull it down and add protection to the photo paper.

At the time of preparing Part 1 of this article I still had not decided how best to finish the fingerplate… you will have to await Part 2 sometime in the autumn.



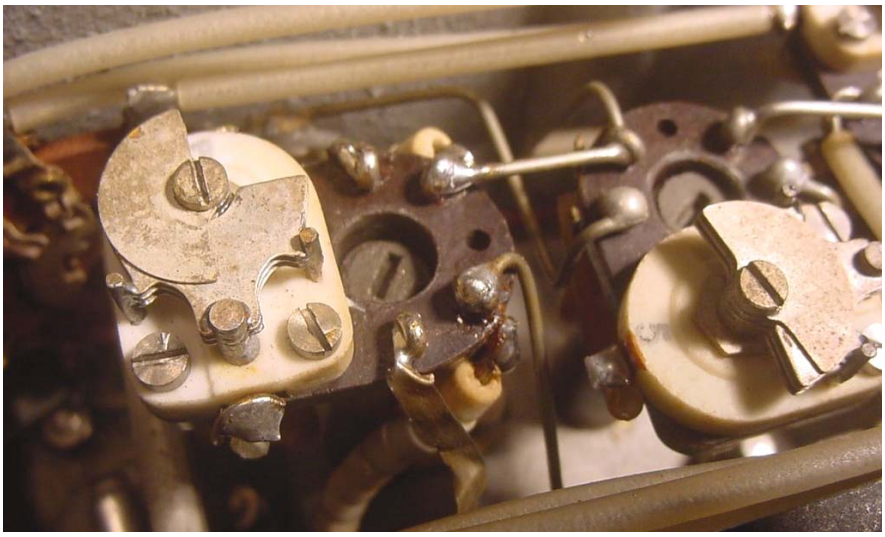
Which is the real Eddystone fingerplate? (answer – none of them!). Top: S.680/2 printed on a laser printer, middle: S.680/2 printed on photo paper, bottom: Bryan Cauthery's S.640 reproduction

Pre-alignment Checks



While the restoration work was on-hold pending powder-coating of the front panel and case, I undertook a close inspection inside the coilbox. I noticed that the slug in the Range 1 aerial transformer was completely rounded-off and there was no sign of the slot for adjusting this. After some preliminary attempts to remove the slug (someone else had obviously tried this at some time and failed), I decided to remove the transformer assembly from the coilbox to work on it. This was not too difficult to do (six wires to unsolder and one screw holding the former in place). I took my time and used a scalpel to shape the end of the slug so that a pair of wide (and substantial) tweezers would find purchase and allow the slug to be turned - all that transplant practice coming in handy again! Luckily I had purchased a small supply of the correct slugs from Ian Nutt some time ago, so after cleaning the former out I inserted a new slug and hey-presto, good as new (photos left and below). The slugs in the remaining RF transformers looked ok – all ready for tweaking if necessary during re-alignment.

Closure – for now

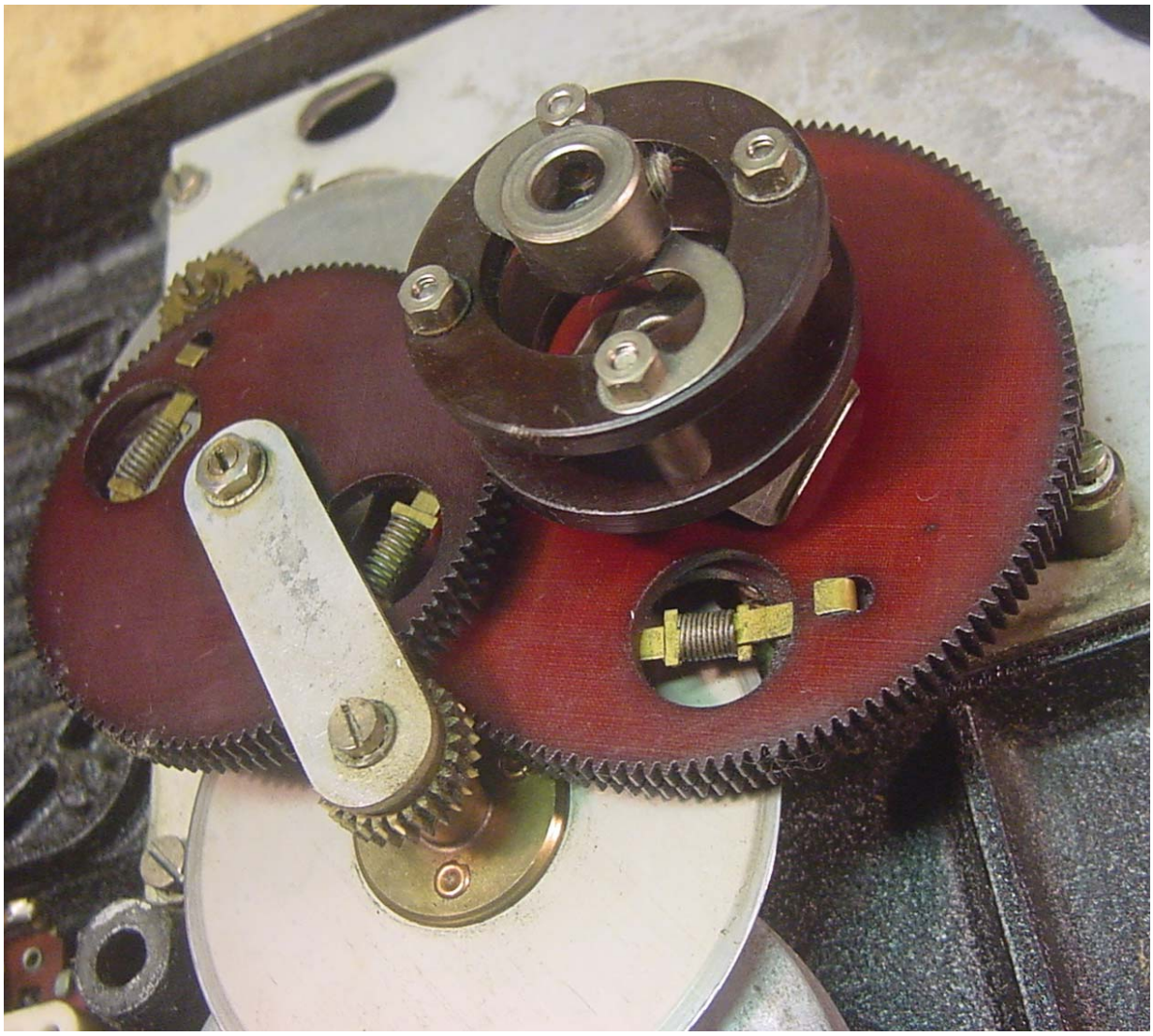


So, quite a way to go yet to have this set back to 'Bath Tub-fresh' condition, but some progress made. Anyway, because of the hiatus awaiting the front panel and case re-finishing and an imminent family vacation in the UK, I decided to split this

article into two parts. The second part – likely to be posted in the autumn of 2010, will cover completion of the reproduction fingerplate, case and front panel re-finishing, re-assembly of the front panel, alignment and final checks/on-air testing. In the meantime, have a great summer and…

…watch this space!

73



Detail of tuning drive train while still attached to the front panel - friction drive plate at bottom (flywheel just visible to its lower-right). Note spring-loaded split gears to minimize backlash

References

- Radio and Television Servicing – Pre-1953 Models, F. Molloy & W.Poole
- Every Second Counts – The Race to Transplant the First Human Heart, Donald McRae, 2007, ISBN-13: 978-0425215227
- Various documents downloaded from the EUG website (http://www.eddystoneusergroup.org.uk/):, including:
  - The Ultimate Quick Reference Guide (QRG), 2nd Ed., 2005, Graham Wormald, G3GGL
  - S.680 and S.680X Manuals
  - Numerous articles in the EUG Newsletter/'Lighthouse', including:

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- **a**cquired by Simon Robinson..... 62.....36
- advert ..... 14.....18
- ..... 29.....5
- Norway ..... 44.....10
- Stratton & Co Ltd (1949) ..... 77.....6
- aerial fault cured, Graeme Wormald..... 77.....11
- ..... 77.....31
- alignment frequencies ..... 4.....3
- audio amplifier, use as..... 45.....3
- bass, lack of..... 33.....20
- Belgian Congo, used in ..... 55.....39
- bfo, fault ..... 33.....8
- customised version..... 24.....18
- differences between early & late models..... 25.....12
- ..... 29.....27
- drift ..... 12.....14
- ..... 74.....15
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- history of one from new (Ellis Taylor) ..... 14.....18
- knob variations..... 62.....7
- ..... 64.....63
- N.Z. models ..... 12.....22
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- transformer rewind..... 50.....29
-
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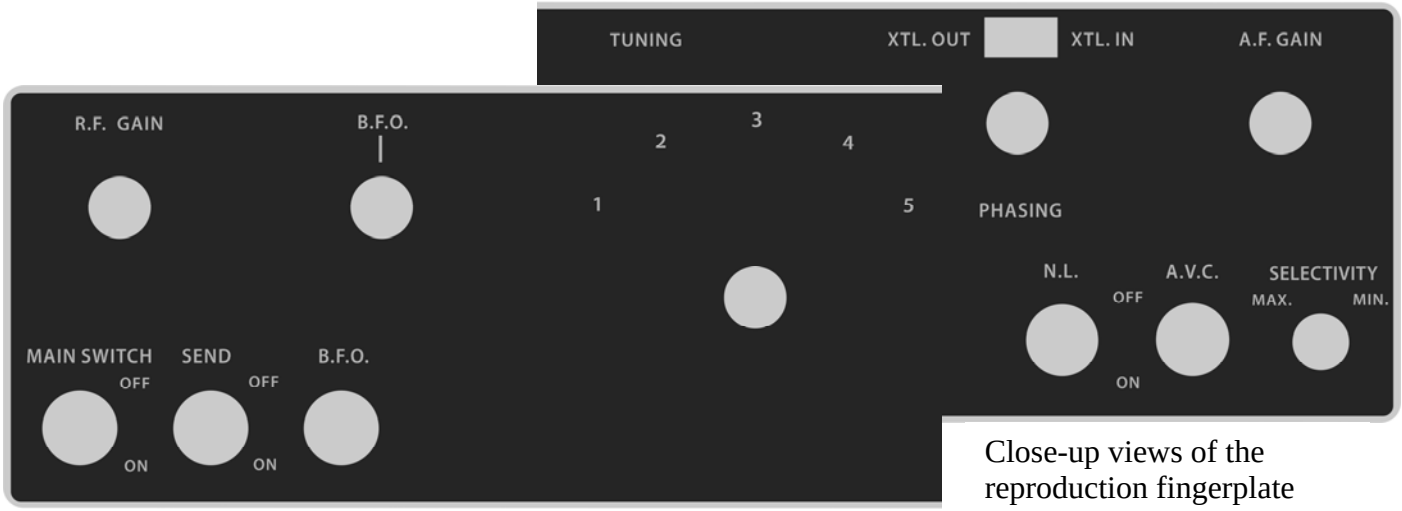
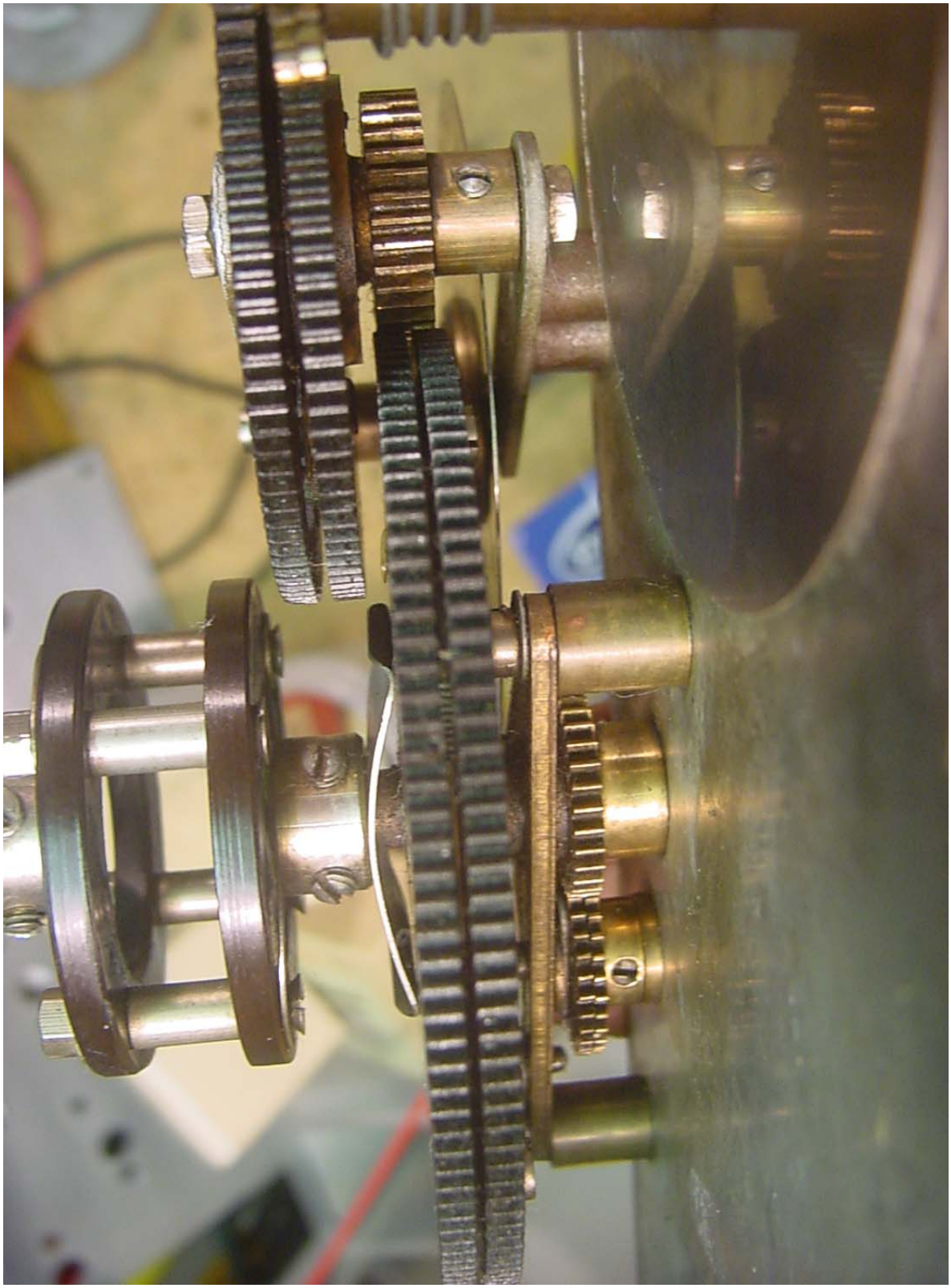
- variable bandwidth system ..... 34.....14
- wiring, incorrect, early sets..... 62.....9

Model 680X

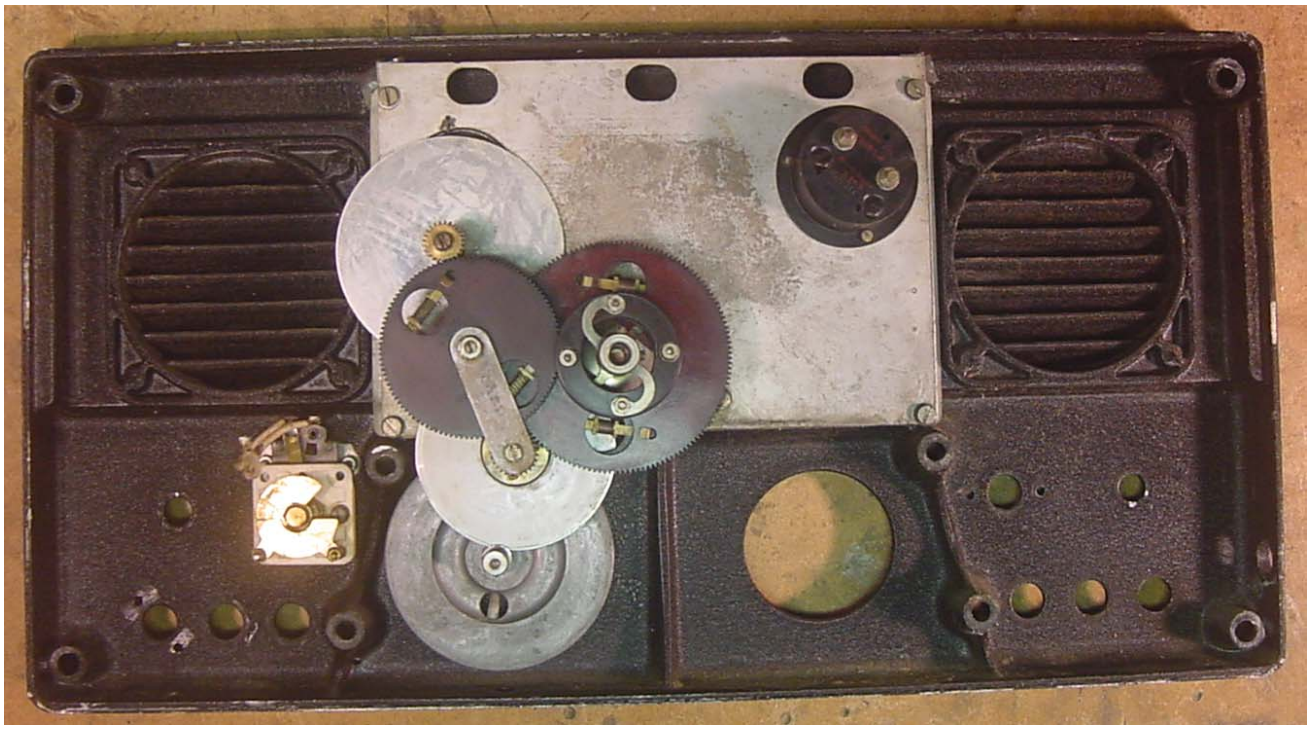


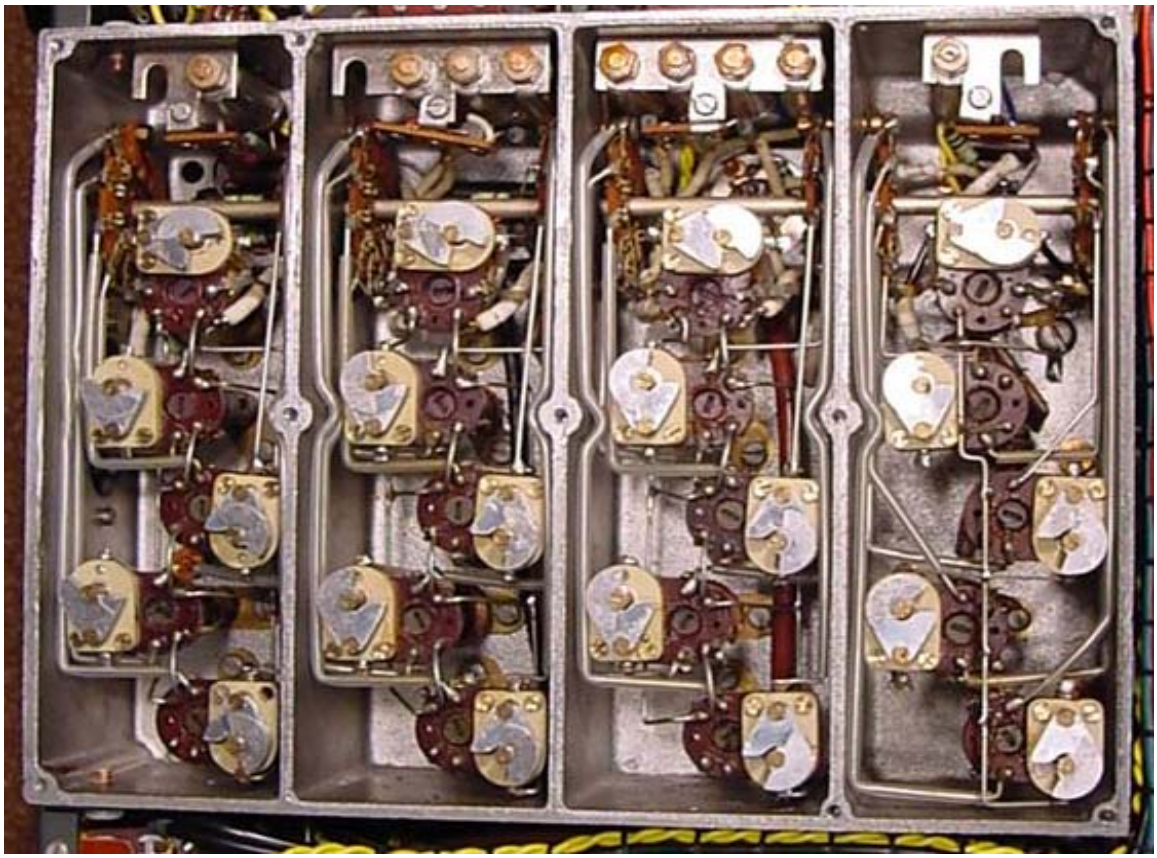
Close-up views of the reproduction fingerplate artwork



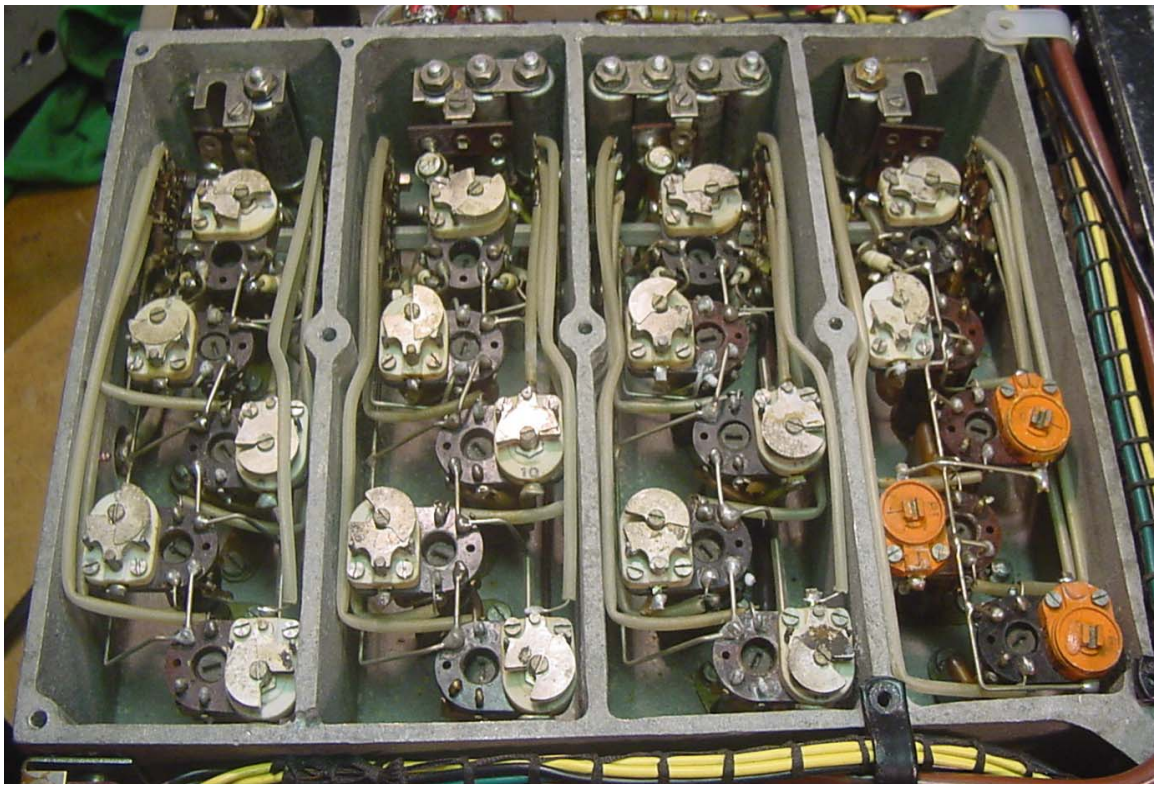
Another view 'close-up and personal' in the S.680/2 gearbox – now looking very clean and ship-shape. Remarkably little wear on those 60+ year old Paxolin gears

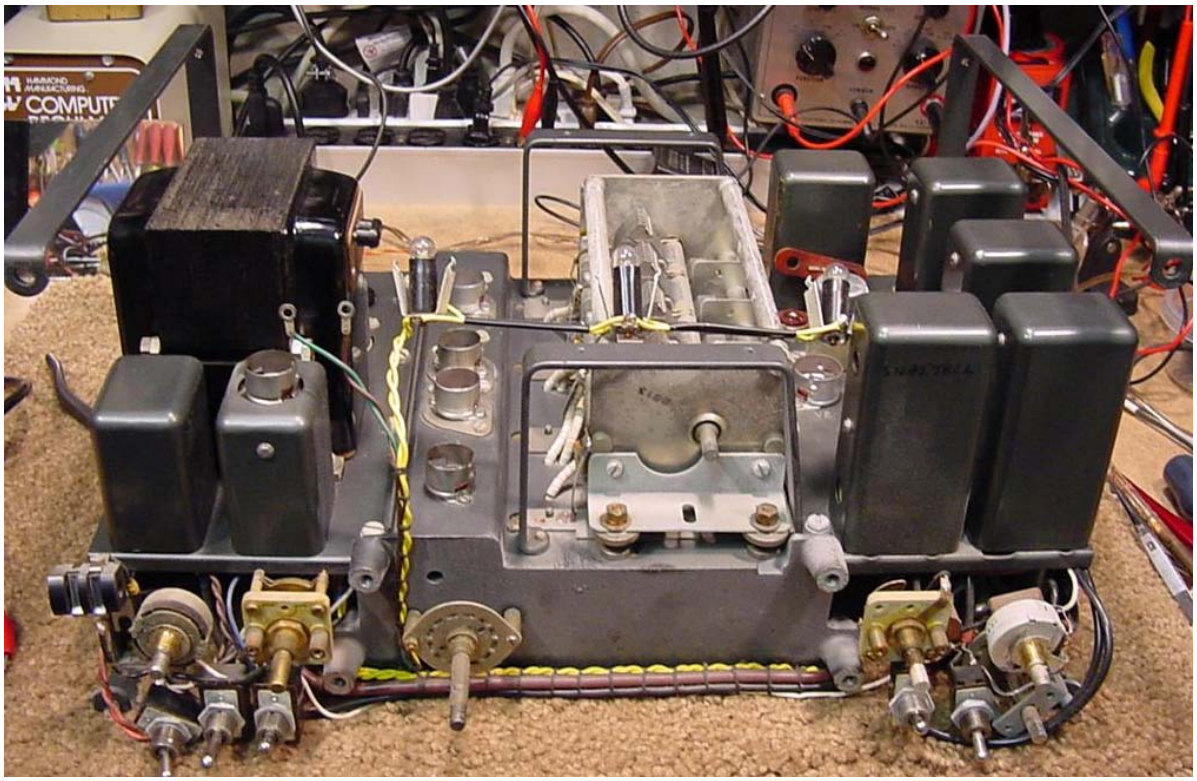
Above: Late-model S.680X front panel and gearbox. Below: S.680/2 front panel and gearbox. This is the most radically-changed part of the set. Note the difference in location of the tuning shaft coupling



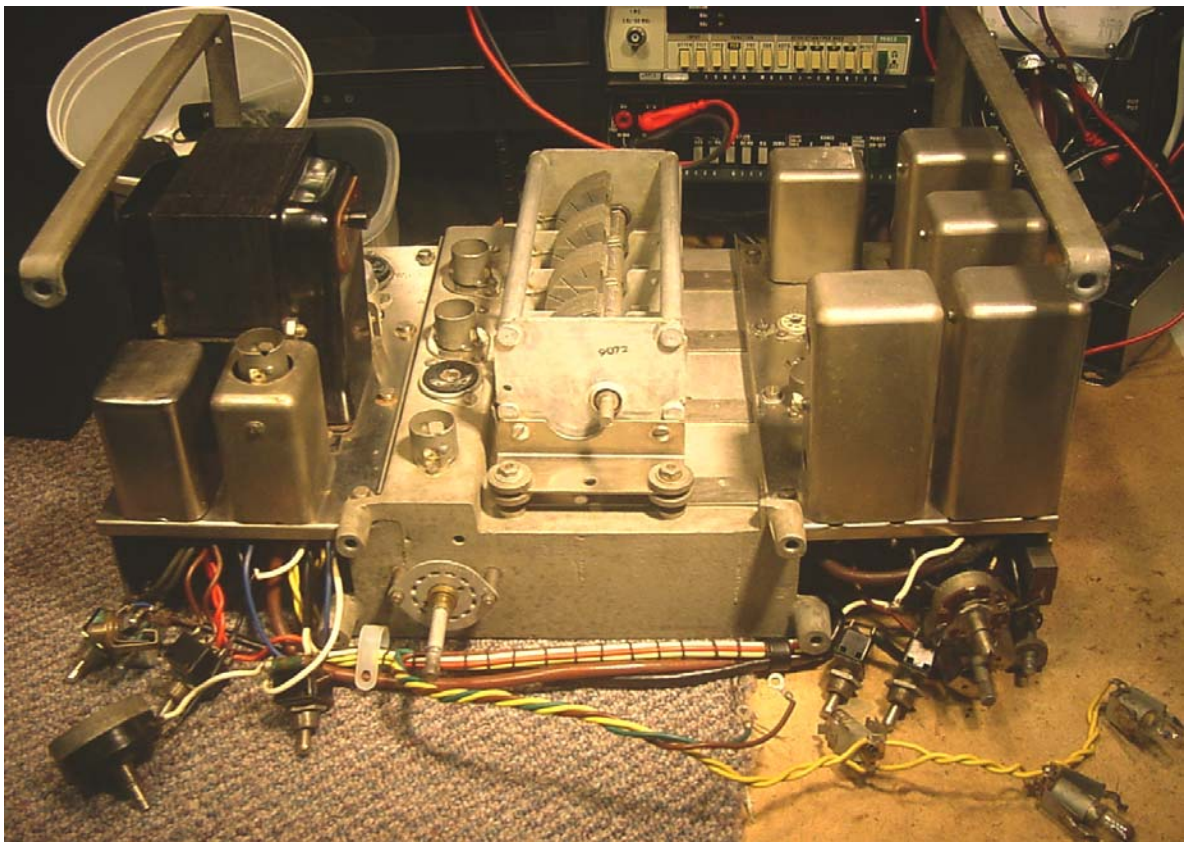


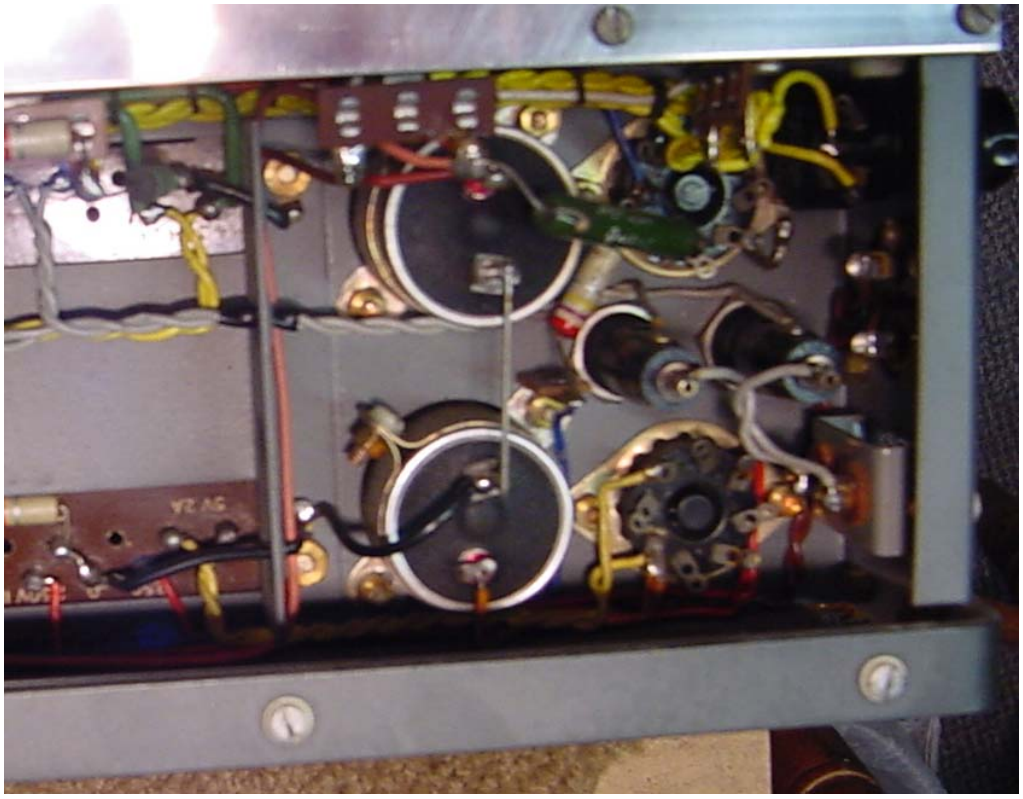
Above: Coilbox in late-model S.680X. Below: Coilbox in S.680/2. Note the use of ceramic trimmers in the local oscillator section of the earlier model (orange-coloured). Otherwise much the same



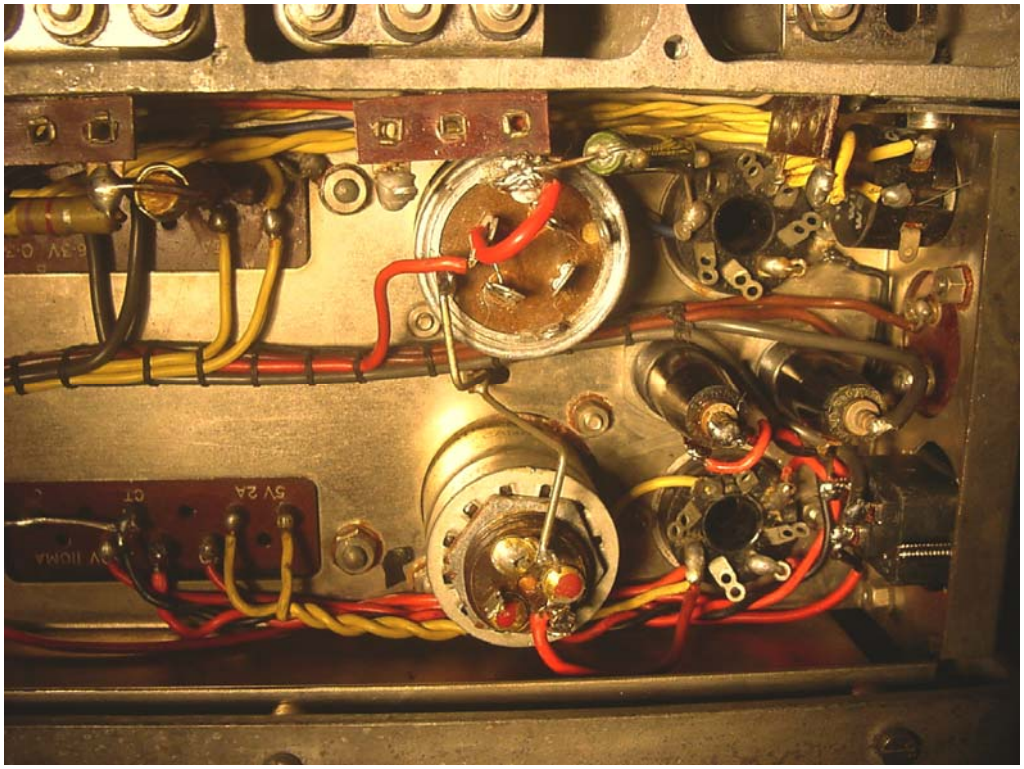


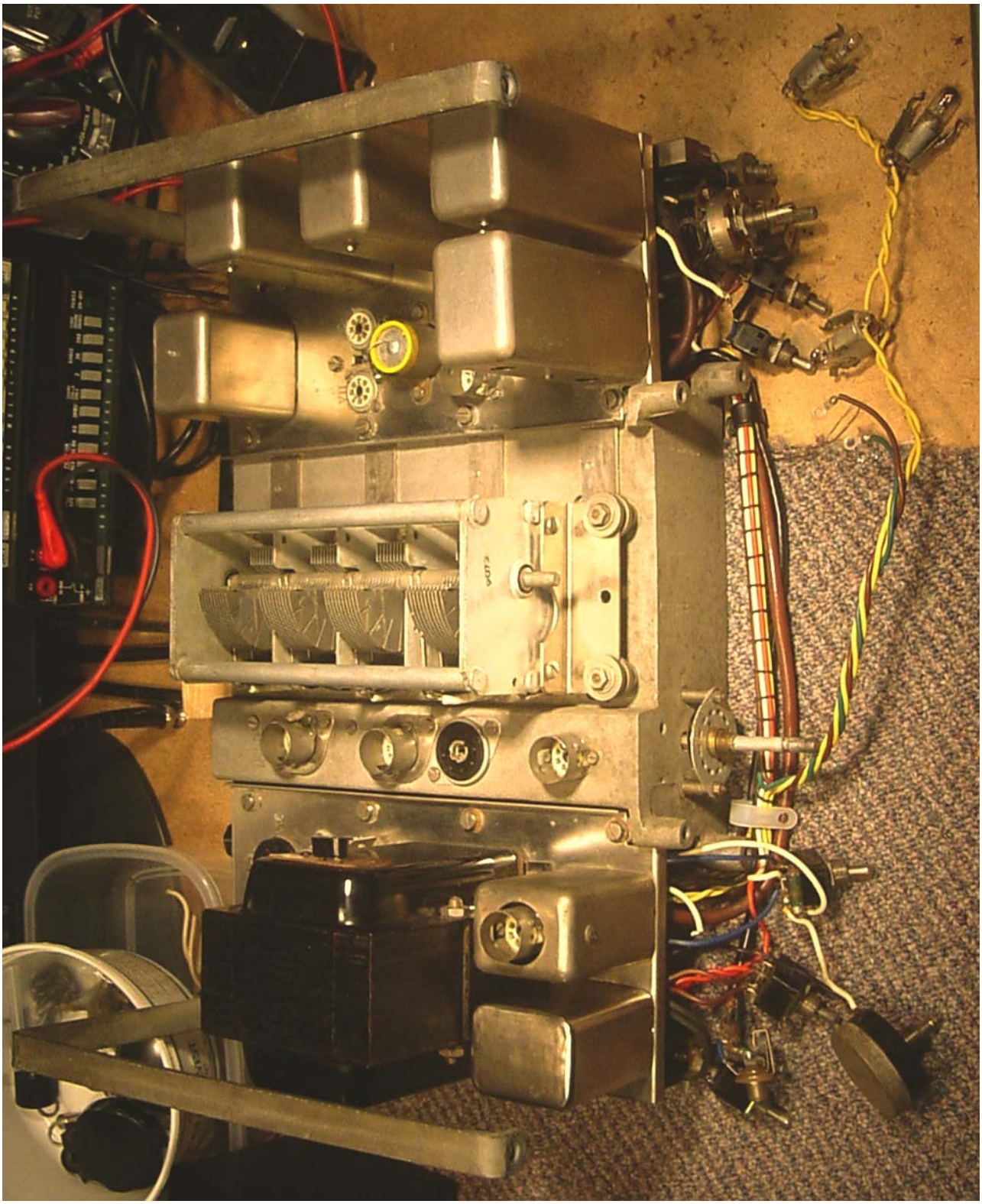
Above: Late-model S.680X with front panel removed. Below: S.680/2 with front panel removed. Note that the primary mechanical difference is in the location of the main tuning gang – offset to the right of the coilbox casting in the later set, to the left in the earlier set. Otherwise very similar





Above: Late-model S.680X power supply section. Below: S.680/2 power supply section. Note that the power supply HT filter electrolytics have been changed-out in the S,680/2. The S.680/2 has also had a modification to use one of the chassis-mounted fuses for the HT line and is fitted with an IEC power connector





Can I have my case and front panel back please? – its rather chilly without them… and please, don't stare (its very rude!!)