Restoring a National NC-183 Communications Receiver – Gerry O’Hara

Introduction

Some years ago, when my interest in ‘things radio’ was being re-kindled by collecting and restoring vintage domestic radios, my interest in tube communications receivers was also sparked. Initially, this was focussed on my innate nostalgic interest in Eddystone receivers manufactured in the UK by Stratton. However, this nostalgia soon spread to other communications receivers that I had heard about in my youth in the UK, but had never seen ‘in the flesh’, let alone heard, and certainly could not afford. I recall looking at back-copies of ‘QST’ in my teens and longing for one of those amazing-looking American ‘boatanchors’ – they looked fantastic: more features than you could shake a stick at, and even more knobs to control them and help pull in the most recalcitrant of signals. So, today, I have a modest collection of iconic tube communication receivers, mainly Eddystone, but also including a RACAL RA-117, Hammarlund SP-600, Hammarlund HQ180, Collins 75-A2, RCA AR88LF, and, of course, a National HRO.

Always with an eye out for a bargain, I was perusing the stalls at the Puget Sound Antique Radio Association’s annual ‘swap meet’ in Shoreline, WA in 2011, when I happened upon a National NC-183 that was just being placed on a table by the vendor. There was already a couple of folk sniffing at it when I saw the price tag – quite a bargain – or was it? The cabinet was nicotine-stained, well-scuffed and had a large ding front and centre at the top (photo, below), one of the knobs was gnarled and its general appearance was rather ‘down-at-heel’. I lifted the lid (photo, page 3) – all the tubes were present and, apart from more nicotine staining and some rusting of the top of the chassis, it looked in one piece. I asked the vendor if it worked – of course, he said
“well, it did the last time I tried it”, but added that “it could probably do with a bit of a tweaking though”. At this remark, one of the other guys looking at the set moved on, but the other was checking his wallet. On an impulse, I said ‘Ok, I will take it’… a fistful of dollars quickly exchanged hands, I borrowed a cart, and walked my new acquisition back to the parking lot and my waiting Jeep. Was this to be one of those moments of impulse that I would regret? Maybe, maybe not... though it would be quite a while before I would get to find out for sure.

Post WWII, the National radio company continued developing the famous HRO range of receivers, the initial models of which rolled off the production line over a decade earlier. The newer HRO models used more modern tube types, built-in power supply and eventually, with the HRO-50 in 1949, a direct frequency readout sliderule-type dial (photo, left). However, National, in parallel with the HRO product line, also started to design and manufacture some all-new receiver designs. This included the ‘moderately priced’ NC-173 in May 1947 ($179), and the NC-183 in July 1947 ($269), these models being produced alongside each other until the NC-173 was discontinued in 1951. The NC-183 built on the NC-173 design by adding an extra stage of RF amplification (mainly to improve image rejection on the higher frequencies, but also increasing sensitivity) and was fitted with an impressive push-pull output stage using a pair of 6V6’s. Both models were fitted with an accessory socket that allowed a Narrow Band Frequency Modulation (NBFM) adapter or a ‘Select-o-Ject1’ unit to be connected to the receiver. However, the NC-183 was later replaced (in 1952) by the NC-183D that looked very similar externally to the NC-183, but that incorporated several significant changes and improvements, the most important being dual conversion to improve image rejection on the higher frequencies, and an extra stage of IF amplification. The NC-183D also used a mixture of miniature tubes and octals (the NC-173 and NC-183 were all-octal designs), eg. 6BA6s in the RF and IF stages and 6BE6s in the converter stages, but still used the trusty 6V6s to drive the speaker. The NC-183D, the ‘D’ representing ‘Dual conversion’, although costing $369 at its introduction ($449 when discontinued) was a very popular and competent set and so was produced right through to 1959 as a mid-priced model in the fairly extensive National range of models during this period. The NC-183 was manufactured for a relatively shorter period, from

1 The name Select-O-Ject is derived from ‘frequency selective amplifier, oscillator and rejection filter’. The circuitry of this add-on unit consists of two constant output audio amplifiers. One can be switched for either zero or 180 degree phase inversion. The other shifts the phase 180 degrees at a specific frequency set by the ‘pitch’ control. Combine the outputs of these amplifiers and the resulting signal, at a set frequency, is either ‘rejected’ if the two outputs are out of phase, or ‘boosted’ (selected) if the two are in phase. The circuit uses regenerative feedback, controlled by the ‘boost’ pot. This control can be advanced to the point of oscillation. A terminal on the back, marked ‘key’ allows keying the oscillator, turning the unit into a code practice oscillator. However, the key terminals must be shorted in order to use the unit as a filter (Source – Emmitt’s Fix it Shop website: http://emmittsfixitshop.com/Projects_HRO_SOJ.html).
mid-1947 to 1952. So, why did National supersede it with a lookalike and almost namesake? (why not name the new model an ‘NC-193’?)... was the NC-183 becoming a ‘dog’ as the higher frequencies became more popular and crowded in the 1950’s? It’s something that I often wondered as I watched sets come and go on eBay over the years. So, this was my opportunity to find out. Hey, and why did they not fit a product detector in mid-production run as SSB became popular and rename it the “NC-183DP”?

First Impressions

When I arrived home, I did what I rarely do with a newly-acquired receiver: I plugged it into my Variac, connected a speaker and switched on, winding the voltage up slowly. Soon a faint hiss could be heard. Hopefully, I connected an antenna and tuned across the Broadcast Band – nothing but the strongest stations could be heard, and then only very faintly and distorted at that. Apart from a slight hiss and some spurii, next to nothing was heard on any of the shortwave bands – then I noticed that the crystal phasing control shaft ‘wobbled’ and cut the noise/signal in and out as I moved it. Altogether one very sick receiver. I tried swapping out a few tubes with no improvement. I decided to take the case off and give the chassis a better inspection and some initial nicotine removal. The cabinet sides and front panel are fabricated out of one piece of metal, with the louvered rear panel attached with self-tap screws. The hinged access lid is mounted on this rear panel. A separate panel forms the base and allows good access to the}

---

2 I am a past-master at nicotine removal: back in 1975, I was between my second and third years at Sheffield University in the UK and needed some cash. My usual summer job, working in a radio/TV repair shop did not pay that well (though I loved the job) and instead I landed a more lucrative job at the Metal Box factory in Carlisle (photo, above right – I even have my ‘Uni’ sweatshirt on). The job was with the maintenance department and at first I thought I was on to the ultimate ‘cushy number’ – cleaning gutters out on the roof; great for the sun tan, watching women walking by, snoozing... However, every silver lining has a cloud: washing the nicotine-stained tiled walls in the ladies and gents washrooms (probably never been washed in decades – they would have been declared ‘sites of anthropogenic significance’ these days and a preservation order slapped on them). Yes, I have witnessed rivers of brown, nicotine-stained water flowing across the floors for weeks on end, and I can still smell the foul odour just thinking about it. For one that has never smoked in his life, that was not the best experience..... but one that I will never, ever forget!
underside of the chassis without having to remove the entire case (photo, below). However, as I wanted to remove the ding from the front panel and re-finish the cabinet, I removed the chassis completely. While I was in ‘cleaning mode’, I removed the two dials from the chassis and cleaned them with slightly soapy water – again, lots of nicotine removed. I was pleased to see that the lettering was not water soluble(!). One problem was evident though: the red lettering on the main tuning dial was very faded (I understand that this is a common problem). I temporarily marked the Broadcast band segment of the dial with a water-based ink, planning to re-do it later with dry transfer lettering when I could find some that I ‘knew I had somewhere...’

The underside of the chassis is very spacious (photo, left, taken on arrival in the workshop), with almost every component being readily accessible. There appears to be a cover missing from the base of the coil box and one of the ceramic trimmers was broken (with one half missing) in the Local Oscillator section (Band ‘D’). Apart from that all looked present and correct. I figured someone had part re-capped the set – and did not too bad a job either, as there were a large number of Sprague ‘Orange Drop’ capacitors, mainly in the RF and IF stages, mixed with some other assorted capacitors that looked older (black, green and brown bodies) – most of these likely being paper dielectric types.

And that is as far as I got back in the late-summer of 2011. I placed the chassis, up-ended, on a side table in the workshop and the cabinet parts in the basement – fully intending to get started on restoring it in the winter months. However, apart from taking the front/sides section of the cabinet to a friend for some metal-bashing on the dint, that’s where it all stayed for almost a year. Radios came and went – several repairs and restorations for the SPARC museum, a couple of interesting sets of my own that needed attention, but mainly my day-job became very demanding, and that plus normal family life meant that I simply did not have the time for the NC-183...
Circuit and Construction

The NC-183 is a conventional single-conversion superhet design, utilizing 16 octal tubes, including rectifier and voltage regulator. It features two stages of RF amplification, a separate local oscillator, amplified AGC, crystal filter with phasing adjustment, double-diode noise limiter, bandspread for amateur bands (6, 10, 20, 40 and 80m) and a push-pull output stage. The tube line-up comprises:

- First and second RF amplifiers, first and second IF amplifiers: 6SG7 (x4)
- First detector: 6SA7
- Local oscillator, phase inverter: 6J5 (x2)
- AGC amplifier: 6AC7
- BFO, first audio: 6SJ7 (x2)
- Second detector, AGC detector, noise limiter: 6H6 (x2)
- Audio output: 6V6GT (x2)
- Voltage regulator: OD3/VR150
- Rectifier: 5U4G

Both balanced and single-ended antennas can be connected to the NC-183, feeding to a switched single-tuned RF transformer for each of the five bands. An antenna tuning capacitor allows the secondary of the antenna transformer to be tweaked for tracking and variations in antenna impedance. The signal from the secondary of the antenna transformer for the band selected couples to the grid of the first pentode RF amplifier (6SG7), the anode circuit of which couples through a single-tuned transformer to the grid of the second pentode RF amplifier (6SG7), the anode circuit again coupling through a single-tuned transformer to grid 3 of the pentagrid mixer (6SA7). RF gain control is effected by varying the grid bias on the two RF stages, mixer and the two IF stages. A triode (6J5) operates as the local oscillator, feeding the local oscillator signal, tracking high of the signal frequency, to the grid 1 of the mixer tube. The IF (nominal 455kHz) signal is transformer-coupled from the anode of the mixer to the crystal filter circuit which has provision for six bandwidths, five of which include the crystal in circuit, the remaining position bypassing the crystal. A crystal phasing control is provided. Output from the crystal filter is fed to the grid of the first IF amplifier pentode (6SG7), the anode circuit of this coupling to the grid of the second IF amplifier pentode (6SG7) via a double-tuned transformer. The grid of the AGC amplifier pentode (6AC7) is fed IF signal from the grid of the second IF amplifier tube. The anode circuit of the AGC amplifier includes a single-tuned circuit at the IF frequency, this being coupled to half a double diode (6H6) acting as the AGC detector, this also driving the S-Meter when the AGC is operating. The anode of the second IF amplifier couples to the detector diode (second half this 6H6) via a double-tuned transformer. The BFO comprises a pentode (6SJ7) that is capacitance-coupled to the detector diode. A second 6H6 double diode acts as a switched/adjustable series noise limiter in the audio path from the detector to the first audio amplifier pentode (6SJ7) via the AF gain control. Tone control is effected by a simple variable resistor/capacitor on the anode circuit of this tube, the anode also being capacitor-coupled to the
grid of the phase-splitter triode (6J5), feeding the control grids of the push-pull output tubes (2 x 6V6G). A phono input socket is provided, switching between this and the radio effected by a front panel toggle switch. Phones output is via a switching arrangement on the front panel phones socket from the secondary of the output transformer. The latter provides both 8 ohm and 500 ohm outputs to a three-way socket on the rear panel. Power is provided by a conventional circuit arrangement using a 5U4G full-wave rectifier, with voltage regulation (150v) to the second RF stage and mixer screen grids, local oscillator and BFO tubes, provided by a shunt-type regulator tube (OD3/VR150). Provision for muting the set by disconnecting the HT supply is made via a front panel toggle switch. An accessory (octal) socket is provided that has audio input, regulated and unregulated HT, heater voltage, chassis ground and AGC present. An octal socket fitted to the rear apron allows for battery operation, this socket being fitted with jumpers when the internal power supply is being used.

Five tuning ranges are provided:

<table>
<thead>
<tr>
<th>Band</th>
<th>General Coverage</th>
<th>Bandspread (calibrated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>48 – 56 MHz</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>12 – 31 MHz and 14.0 – 14.4 MHz</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>7 – 7.3 MHz</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>3.5 – 4 MHz</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>0.54 – 1.6 MHz</td>
</tr>
</tbody>
</table>

No specifications are published in the operators manual for the NC-183, however, SAM’s Photofact Vol. 49-15 includes a stage gain table:

```
<table>
<thead>
<tr>
<th>Stage</th>
<th>Gain</th>
<th>Bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenna to RF Grid</td>
<td>1X</td>
<td>600KC</td>
</tr>
<tr>
<td>1st RF to 2nd RF Grid</td>
<td>2X</td>
<td>600KC</td>
</tr>
<tr>
<td>RF Grid to Conv. Grid</td>
<td>2X</td>
<td>600KC</td>
</tr>
<tr>
<td>Conversion Gain</td>
<td>1X</td>
<td>1X 600KC</td>
</tr>
<tr>
<td>Input IF Trans.</td>
<td>.4X</td>
<td>455KC</td>
</tr>
<tr>
<td>2nd IF Trans.</td>
<td>1X</td>
<td>455KC</td>
</tr>
<tr>
<td>3rd IF Trans.</td>
<td>1X</td>
<td>455KC</td>
</tr>
<tr>
<td>4th IF Trans.</td>
<td>2X</td>
<td>400KC</td>
</tr>
</tbody>
</table>
```

Construction is true ‘boatanchor’, the set weighing in at around 65lbs. Point to point connections utilising tube bases and earthing tags onto the steel chassis, plus a few tagstrips are used for the wiring. The ‘coilbox’ comprises a sub-assembly of steel plates, with screens separating the antenna, RF stages and local oscillator coils, the trimmer capacitors being mounted on brackets attached to these dividers. The case comprises four components: a wrap-around piece for the two sides and front panel, a lid, connected to the rear panel with two hinges, and a base plate.
Electronic Restoration

Fast-forward to July, 2012. I had just cleared the workbench of an interesting and challenging Stromberg-Carlson Model 56 console. While tidying-up the bench and surroundings I caught my left elbow on the corner of the NC-183 chassis (which had become somewhat of a fixture on the side-table, with me using it as a ‘hanger’ for a vacuum hose, air gun and test leads) – this was not the first time I had caught one of my limbs on the chassis, but it was the worst cut yet. After stopping the blood flowing, I cleared the stuff hanging on the NC-183 chassis and placed it upside-down on the workbench – determined to deal with it before I sliced through my arm…

It sat on my bench for a week or two, with me occasionally switching it on and making a few voltage readings – most of which did not correspond with the manual. I also made a few resistance measurements and identified leaky capacitors and resistors that had drifted high. Many of the resistors were the small 10% tolerance ½ Watt carbon types common of the period and which often drift high. I decided to check a few of the Orange Drop capacitors – they were all fine, so I left them all in place (though a few were not quite of the value shown in the schematic – close enough though). I tested some of the non-Orange Drop capacitors – some were slightly leaky. I changed all of them all out for new poly film ones, apart from some newer-looking maroon-bodied types that all tested ok, with the two suppressor caps on the power line (between ground and neutral/live) being replaced with 250vAC ‘Y2’ rated safety capacitors. I also replaced the (previously replaced) electrolytics under the chassis. However, the twin-10uF power supply filter capacitor can tested good, having very low leakage, low ESR, and no sign of hum when I had tested the set, and so, with the HT voltage on either side of the choke matching the manual, I left that in place.

I then started to check the resistors – finding almost every one of them was out of tolerance – some reading over three times their marked value, some open-circuit.

After a while I gave up testing them and just replaced
the lot, using 1 or 2 Watt metal film parts for the ½ to 2 Watt carbon types, and a single wirewound 5Watt type for the parallel 2 Watt carbon types in the bias circuit. The only original resistor is now a 10W wire wound unit (R21). The most awkward components to access were three of the resistors: one in the Local Oscillator section (R19), one that is inside the AGC amplifier coil can (R28), and one in the BFO coil can (R36). To access R19, I removed the side of the coilbox (easy to do – photo, right) and while I was at it I replaced the ceramic trimmer that was half-missing (Band D) and another that was found to have a hairline crack across its body (Band E) – photo, left. I opened-up the BFO can to clean and lubricate the BFO variable capacitor, but instead of removing the can from the AGC coil (T6) I simply inserted a pair of small snips into the open underside of the can and cut out R28, replacing it with a 33kohm resistor mounted external to the transformer can.

I then removed one of the sides of the crystal filter unit to access the crystal phasing control – it was now obvious why the control shaft wobbled: the ceramic plate on which the twin stators are mounted was cracked into four pieces (photo, right). The rubber mounting grommets had hardened with age and either someone had tried
tightening the mounting screws to compensate, or had pushed on the control shaft, cracking the ceramic. Now, these capacitors are not common, so two options were open to me – mount the stators and rotor bearing on a piece of Paxolin or acrylic, or try to glue the ceramic back together. I decided to try the latter, as all the parts seemed to be there and fit together ok. I used a high quality super-glue, holding the parts together in a vice and several strong elastic bands while it set. It seemed to glue ok, so I fitted new grommets and re-installed it in the filter unit can (this entails removing the two front mounting screws and pulling the front of the unit away from the rest of the can, allowing sufficient space to manipulate the capacitor back into position (photo, right). While I was in there I cleaned the selectivity switch with Deoxit. Next I looked at the tone control – someone had inexplicably replaced the pot with a switch and had re-wired the circuit with an extra capacitor. I removed the switch, installed a new pot of the correct value, removed the extra capacitor and re-wired the circuit per the schematic.

Below: Detailed views of the chassis – BFO, limiter and audio stages on the left and RF/IF stages on the right
A new (3-core) mains lead was then fitted and I replaced the 5A fuse cartridge with a more suitable 2A cartridge. Before I switched the set on, I cleaned the bandchange switch with Deoxit, gave the various pots a squirt of the same and ‘worked’ them a few times.

I switched to Broadcast Band, connected a speaker and antenna, and brought the voltage up on a Variac, monitoring the HT volts. All seemed good and with around 85vAC applied I started to hear noise from the speaker. As I approach full voltage (115vAC), there was considerable noise from the speaker, and a flick of the main tuning dial brought in a station – satisfyingly loud and clear and no distortion, hum or spurii.

After an extended ‘soak test’ and cruise around the bands, all seemed to be ok, so I decided to give the set a rough alignment as it was a little off frequency on the Broadcast Band (Band E) and quite a way off on Band D, for which I had replaced the trimmers in the Local Oscillator. I followed the alignment procedure in the manual - first for the IF and then for the RF stages. Without the dial markers present (as the chassis was out of the cabinet), I used a ruler to approximate where the marker would be (hence the ‘rough’ alignment of the RF section). All adjusted ok, even the rather strange coil adjustments at the low frequency end of the ranges A through D, comprising moving a half turn of the coil winding inside the coils - just visible in four of the Local Oscillator coils in the photo, above (identified by the yellow arrows). Band E uses a padder capacitor (red arrow) for this. The receiver was now performing very well – actually impressively well: very sensitive and with great-sounding audio through a 10” speaker.

Time I did a little more cosmetic work and re-finished the cabinet…
Cosmetic Restoration

The Broadcast Band markings on the main tuning dial are in red dye, as are the band annotations for the shortwave bands. The red dye had not fared well with the past 60 years or so of light, nicotine and whatever – to the point it was almost invisible – especially with the dial illuminated. I looked on the internet to see if I could buy reproduction dials (apparently they were off-white when new), no luck, so I decided to re-mark the Broadcast Band (Band ‘E’) scale and also add band markers (‘A’ to ‘E’) at each end of the scale. I used some ‘Letraset’ rub-on lettering: some from my own stock (marked ‘Price: 30p, WH Smith’ – I must have bought that back in the UK sometime in the 1970’s, and it just goes to show that things eventually come in handy), plus some more that I found at SPARC. The curved line joining the marker dashes was drawn using a black (0.5mm) ‘fine-liner’ pen, the correct radius being obtained by inserting a quarter-inch shaft through the centre of the dial and using a large metal paper clip, wrapped around the shaft and the pen held in the other end. The result is not perfect, but very readable and quite acceptable in my book (let’s face it, this set is not museum standard) – see photos below (left – before, right – after) – the one on the right is illuminated and clearly shows the Broadcast Band.

As noted earlier, my friend Pat, who also restores vintage cars, had removed the ding from the cabinet. So, the next step was to find a suitable paint. With the nicotine removed from the cabinet, the original paint colour was a light-grey, slightly metallic finish, with the labelling above each of the controls being marked in white (eg. ‘Model NC-183’ in photo below). After some searching, I found an almost exact match – Krylon ‘Dual’ (primer and paint) Satin Nickel finish. I carefully scraped out the white infill from the engraved labelling, then, after sanding the cabinet parts with 250 and then 600 grit paper, I used self-etch primer on the bare paint sections, high-build primer/filler to blend out the worst of the scratches and then gave it an all-

---

3 I found this in the local Wal-Mart – it’s almost an exact match colour-wise for the original paint (or at least it matched the paint on my cabinet when the nicotine and grime was removed), although it is slightly more metallic. The clear coat adds protection, dulls down the metallic finish and adds a good-looking sheen to the surface.
over coat of regular grey primer. This was followed by four coats of the nickel satín-finish metallic paint, all applied in the SPARC museum spray booth. After leaving this to cure for a few days, I infilled the engraved lettering with titanium white acrylic paint and removed the excess with a damp cloth. After a couple of more days to allow the acrylic paint to dry, I applied two coats of universal clear-coat to the entire cabinet and left the cabinet for a week for the clear coat to cure before attaching the ‘National’ badge (photo, above) and installing the chassis in the cabinet. I washed the knobs in hot soapy water – scrubbing the fluted pars with a nailbrush to remove years of grime and (yet more) nicotine.

**Final Alignment**

With the set reinstalled in its cabinet, the time was right for a final alignment. The two red dial pointers needed a slight adjustment so that they had the correct alignment to the dial radii (there are two screws to allow this where they fix to the cabinet - centre two screws above the rear of the dial in the photo, left). No problems were encountered with the RF alignment – my ‘rough’ alignment was actually very close, though I must admit I dislike the ‘cheap and cheerful’ wire-bending alignment technique on the lower end of the shortwave bands – I much prefer slugs.

The selectivity control on the NC-183 has six positions, ‘1 through 5’ and ‘off’, the latter bypassing the crystal filter unit. Even after careful alignment of the IF as described in the manual, I found that although a very sharp null could be obtained in all crystal positions using the phasing control, the selectivity, although sharper than in the ‘off’ position, did not seem to be much different between the various settings of the switch. I will probably use my wobbulator and a scope to check/tweak the IF at some time, though I decided that I could live with it for now.
Restoring a National NC-183 Receiver

Gerry O’Hara

Closure

Well, I must admit that I was more than pleasantly surprised by the performance of this receiver – it is amazingly sensitive, albeit a little noisy, and the audio quality (and volume) is just superb. So, was it a ‘dog’ that had to be upgraded? – definitely not! Yes, the image rejection on the higher frequencies is not excellent – but it’s much better than most single-conversion superhets and quite useable on the 20m, 15m and 10m amateur bands (I did not try it on the 6m band – but it received my signal generator signal just fine at 56MHz). The crystal filter operation is not the best I have come across – as noted above, it does a good job of nulling-out an unwanted carrier from the passband, but the filter response (even after some tweaking) leaves something to be desired - I may try changing-out the filter capacitors some time (C31, C32, C33, C34), though these are ceramic types that are usually reliable. Strangely, in my set, C34 is a compression trimmer and appears to have been that way from new - the corresponding adjustment hole in the top of the filter can and wiring all look original – this is as per the NC-183D (‘crystal compensation’ - C29 on the N-183D schematic).

So, in summary, the NC-183 is a rock-solid mid-twentieth century bandcruiser that has superb audio when listening to Broadcast Band stations, can winkle weak signals out on the Shortwave Bands, has good amateur bandspeading, can reject unwanted carriers, can receive SSB quite well with the RF gain backed off and the audio gain turned up, and even has 6M band coverage. It certainly also really ‘looks the part’ - with the twin dials, S-Meter and impressive symmetry of its controls – just like being in a classic American car of the same era… I love it!

Gerry O’Hara, VE7GUH/G8GUH, Vancouver, August 2012 (gerryohara@telus.net)
Above: lid open view of the restored chassis – all very accessible. Below: rear view of the restored cabinet. I am puzzled as to what the punch-out plate is for on the upper left – any ideas?
Above: underside of the restored chassis installed in the cabinet. Note the capacitors around the output tubes are different from the detailed photos on page 7 – I had originally wired a single 0.001uF capacitor across the two output tube anodes per the schematic, then realized this set (SN: 241-0166) was probably a late model NC-183 and had some parts of the circuit wired per the NC-183D, including fitting two 0.002uF capacitors between the anode and screen grid of the output tubes instead of the single capacitor, so I reverted to this configuration (as it was when I received it). Below: underside of the refinished cabinet.
Above: main tuning dial after re-drafting the Broadcast Band (Band E) part of the scale and re-labelling the scales A through E. Below: rear section of the tuning gang showing the antenna trimmer – this needed some adjustment in my set (tightening the bearing), as the rotors and stators tended to touch and prevent correct operation.
Above: limiter, BFO, and audio stages. I struggled with the DC voltages in the output stage: those provided in the NC-183 manual (Fig. 4, inset left) for the 6V6 tubes do not make much sense and could not be obtained in my set – more sensible ones are shown in a voltage table present on a copy of the schematic included in the SAMs Photofact (Vol. 49-15) for the NC-183 (inset, right) that almost exactly matched those in my set.