VINTAGE RADIO

By RODNEY CHAMPNESS, VK3UG

The AWA 532MF 32V Table Receiver

In the January 2001 issue, we described the Operatic Mignon 32V receiver. This month, we cover another 32V set, AWA's high performing 532MF, also known as the Hotpoint-Bandmaster V55DD. This used a line-up of high-gain valves to give it very good performance on broadcast and shortwave bands.

The 532MF was produced from around 1950-1955 and is a 5-valve receiver. The valves used are 6BA6 RF stage, 6BE6 converter, 6BA6 455kHz IF stage, 6AV6 detector, AGC and 1st audio stage, followed by a 6AQ5 pentode audio output. It covers the normal AM broadcast band and the popular international 6-18MHz shortwave band. Due to the use of these high gain valves the performance is extremely good – as you would expect.

The set is virtually a high performing 240VAC receiver that has been designed to work off 32V DC, drawing a total current of 1.3A (see Fig.1). The heaters are wired in series to operate directly off 32V. As the 6AQ5 draws 450mA of heater current and the other valves only draw 300mA, the equalising resistor R21 ensures that the extra 150mA drawn by the 6AQ5 is shunted away from the other valves. The 200V DC of HT (high tension) is provided by a synchronous vibrator power pack running directly from the 32V.

The voltage supplied by 32V lighting plants varies considerably, so a series resistor (R23, 5Ω) is switched in series with the supply to drop the voltage applied to the set by around 6.5V when the batteries are on charge.

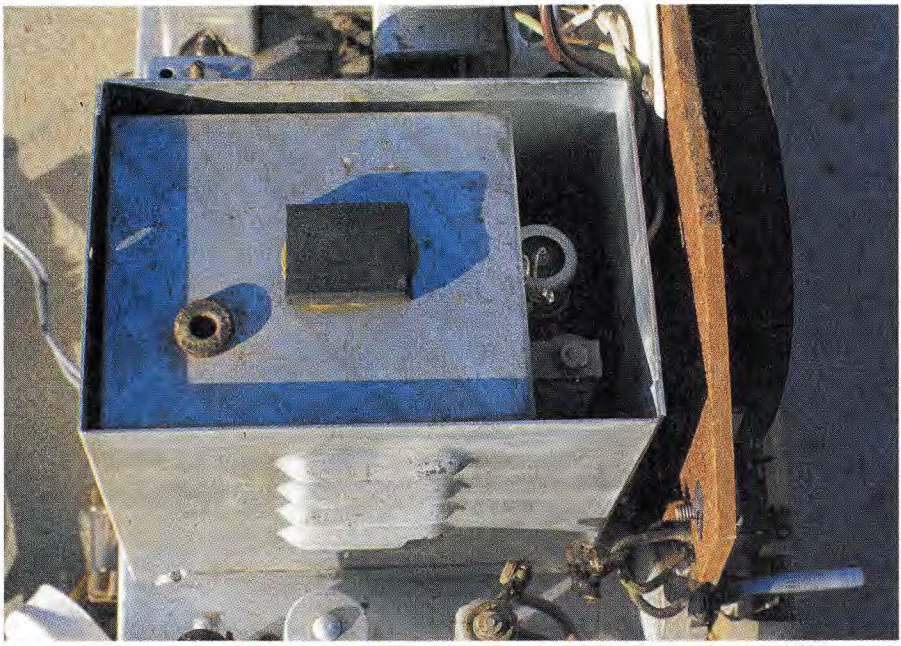
With 16 fully-charged cells the nominal voltage supplied is 33.6V (2.1V per cell). When the batteries are flat the voltage drops to 28.8V and when fully charged and gassing the voltage rises to 40V, hence the dropping resistor R23. Some users of 32V lighting plants put an additional cell or two in series with the battery bank, which makes the supply either 34V or 36V.

Under these circumstances, the battery voltage could easily rise above 40V on charge – way in excess of 32V. This was done to overcome the voltage drop on the power cables from the batteries to wherever the electricity was being used. But it gave some of the appliances (including radios) a bit of a hard time. Globes burnt really brightly!

In the May 2000 article, I spoke of making obsolete 6V and 32V sets useful when AC power became available in farming communities. One of the sets I did convert was a 532MF and it performed well. A secondhand shop asked me if I'd fix up a set that they had got in that continually blew fuses. It was an unmodified 532MF and they were trying to get it to work on 240V AC! I said that I would be interested in doing a swap as I had a converted set that worked well and I really wanted an unmodified receiver.

We did a deal – I just hoped that the

As was the case with all Australian sets of that era, the AWA 532F has all the major broadcast station markings for every state.



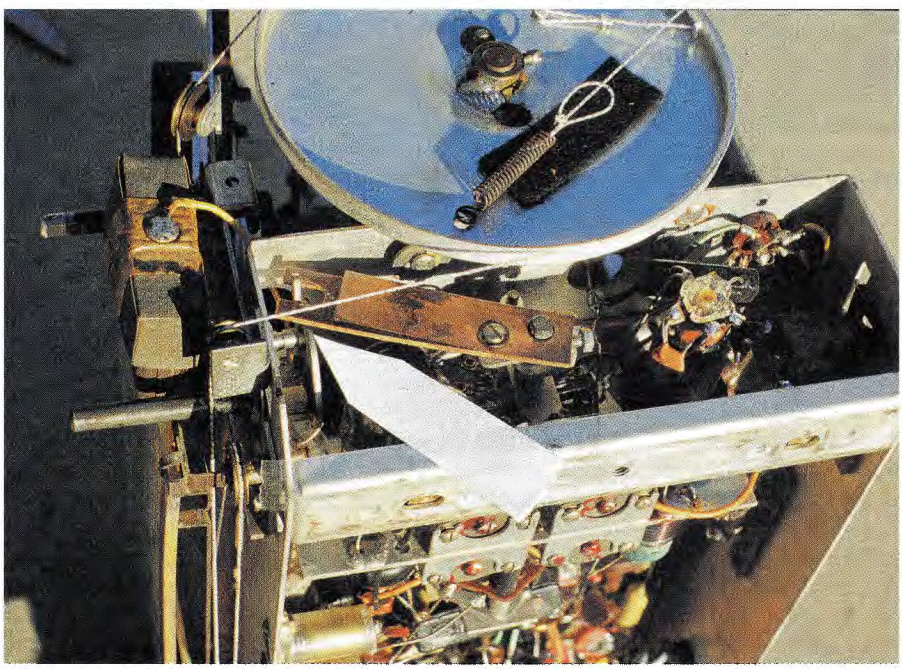
This view inside vibrator power supply box shows the second shielded box. This two-box construction was used to suppress vibrator hash and noise.

damage to the set was only to the fuse. Fortunately the fuse was the only damage done – but if the fuse had been larger than the 3A fitted, the set could easily have been a write-off.

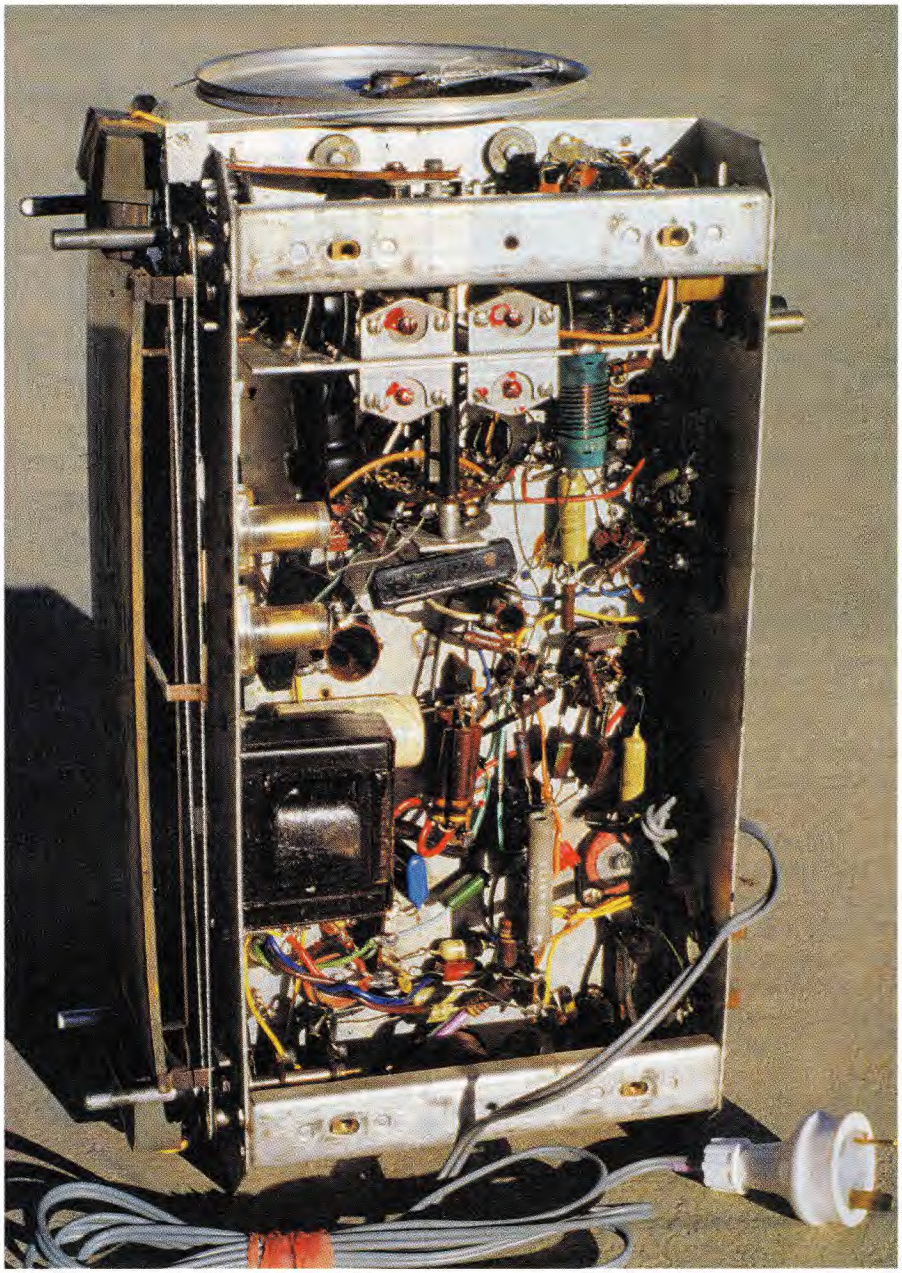
Restoring the 532MF

Removing the set from the cabinet first involves pulling off of the four push-on knobs and laying them aside with the celluloid sheets that have the control functions marked on them (that is, if they are still with the set; mine weren't). You then remove the four screws from the back, withdraw the four bolts under the cabinet and slide the chassis out.

That done, the set can be turned upside down as it will largely rest on the vibrator power supply box. The set is full of black "moulded mud" paper capacitors. If they have splits anywhere on them it is advisable to replace them. The audio couplers (C28, C33) and the AGC bypasses (C7, C9, C18) should be replaced as a mat-



This under chassis view shows the right angle drive to the wave change switch (the large white arrow points to the mechanism).



The under chassis layout is quite good for component accessibility. Note that the original black "moulded mud" paper capacitors have been replaced with dipped polyester capacitors.

ter of course, by polyester or greencap capacitors.

The resistors can be checked to be sure that they are within tolerance but I've found they're rarely at fault.

Cleaning up

The set was relatively clean and only required a dust out and a light scrub with a Nylon scouring pad, dampened in kerosene, to get it in quite good nick. The cabinet got the usual scrub in soapy water in the laundry trough. It is always necessary to be careful not to wet the speaker cloth, unless it is being taken out to give it a really good clean.

The dial lamps were OK and were not showing darkening in the envelope, so they were left alone.

Even the dial cord was in quite reasonable condition. The dial drive system is not the easiest to re-string and requires nearly two metres of cord to do the job. It is desirable to remove the dial pointer and the dial scale before endeavouring to re-string the mechanism. It is just so much easier to do once the dial scale has been removed.

I replaced the power cord and the power plug. I don't leave 3-pin plugs on any sets that don't work on 240VAC mains. Instead, I fitted a 2-pin polarised plug so that the set can not be accidentally plugged into the mains (as the secondhand dealer had done earlier).

I coupled the set to my 32V DC power supply to see how it performed. I made sure that the chassis was attached to the negative terminal of the supply. Many 32V sets were connected up with positive to the chassis – and they don't work with a negative HT voltage! Surprisingly the electrolytic capacitors didn't seem to suffer provided the sets were not left with reversed voltage on them for more than 30 seconds or so. Usually customers who bought a 32V set were told to connect it to power and if it didn't operate within around a minute, to turn it off and reverse the connections to the power plug! The set would then operate.

Mine performed quite satisfactorily and the valves were all in good order. However, the HT voltage was down a bit so a check of the power supply was called for.

The circuit does not show it but the set has provision to use it with a 32V turntable so that records could be played through it. I wonder how many sets with this provision were actually used with a record player?

Vibrator power supply

Vibrator power supplies are not as easy to service as AC mains supplies. For a start, the supply is shielded. In fact, it consists of a shielded box with another shielded box inside it, as shown in one of the photographs. The shielding is indicated on the circuit diagram by the dashed lines around the vibrator portion of the circuit.

To remove the supply for service, it is necessary to first unsolder the black (earth), yellow (+32V) and red (HT) wires which come out of the supply (noting which tagstrip points they come from). You then remove the top cover by removing the self-tapping screw at the back of the supply and lifting it off. Inside you will see the second box, which can now be lifted out.

The outer box sits on several rubber grommets and the inner box has foam rubber glued to its sides, bottom and top, as resilient mounts. The rubber mounting is to make sure that the mechanical vibration of the vibrator

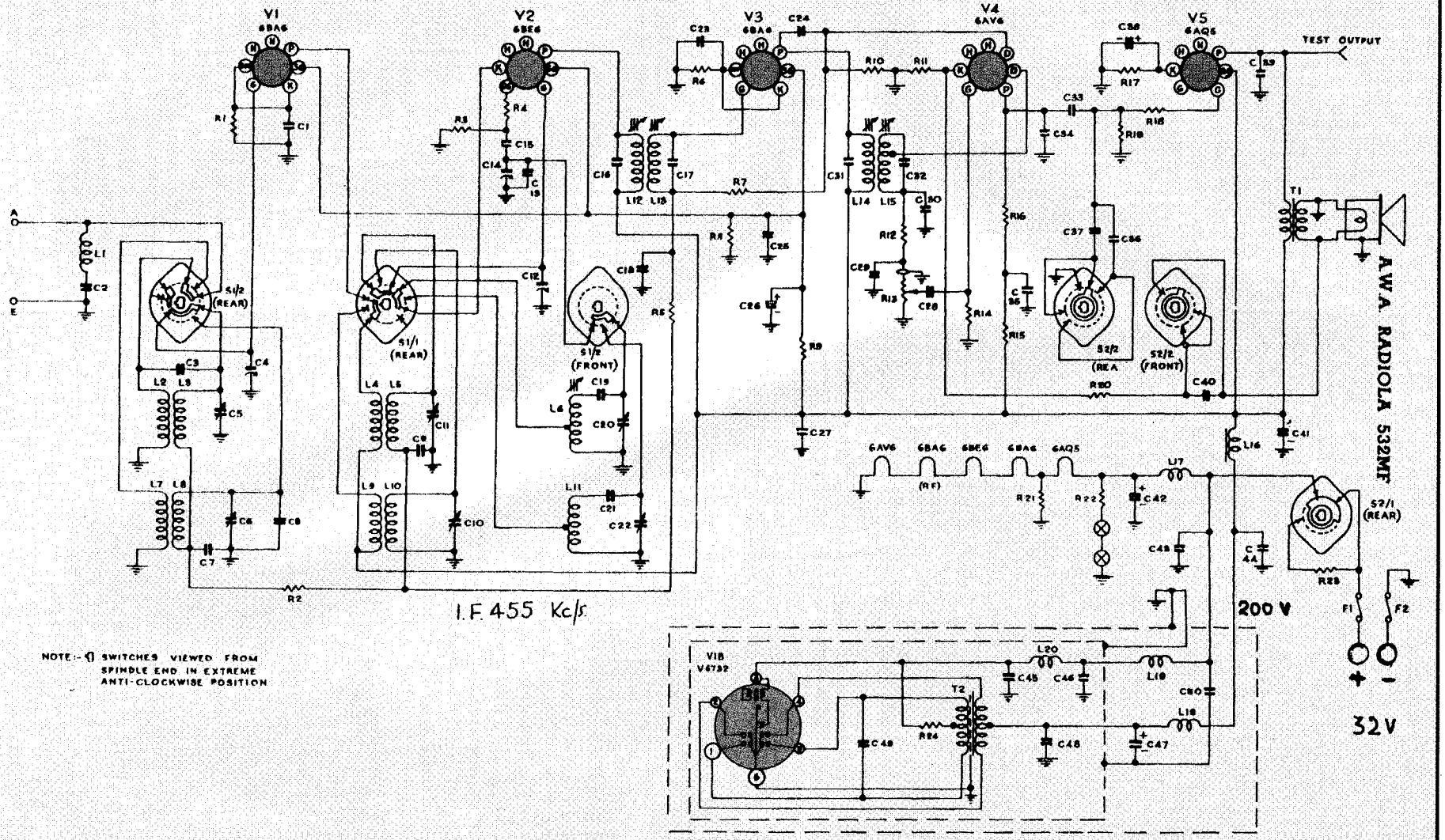
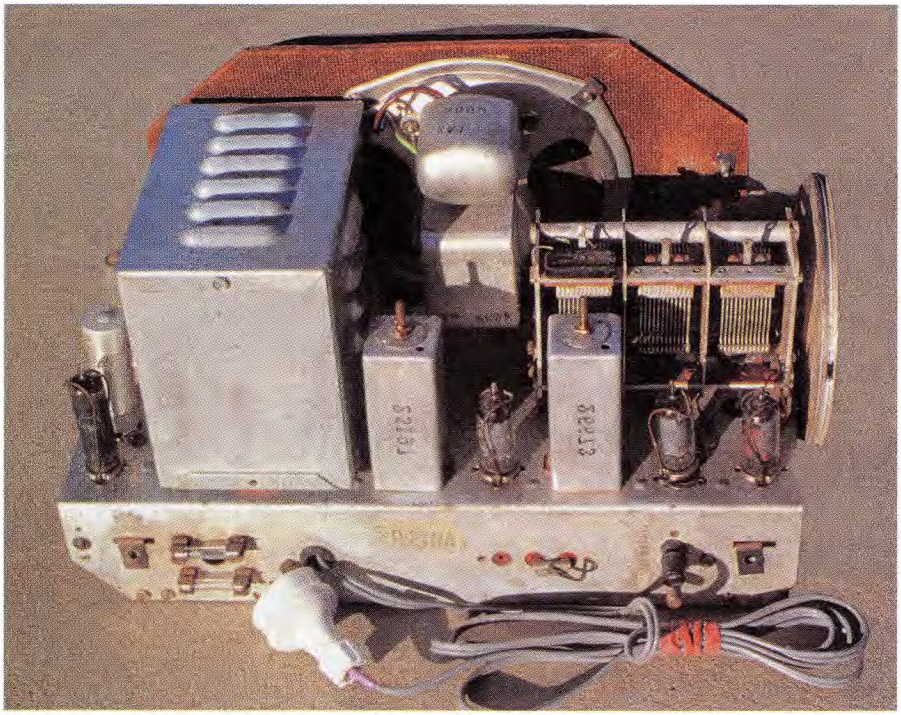


Fig.1: the AWA 532F was intended to be run from 32V lighting systems on farms. All the valve filaments are run in series across the 32V supply and an equalising resistor (R21) takes care of the fact that the 6AQ5 filament current is higher than for the other valves.



This is the rear view of the chassis. The large metal box is the vibrator power supply. Note the 6AQ5 valve located at the end of the chassis. This means that the set cannot be sat on its end unless a block is put under the side of the power supply to protect the valve.

is completely muffled. The rubber mounting is also intended to make sure that the supply is only earthed at one spot, to reduce the likelihood of the receiver picking up interference from the supply.

Without this elaborate shielding and the accompanying filtering, the interference would be so bad that only the strongest stations would be audible above the obliterating hash. Sets of this type are intended to operate in remote rural areas, so the interference generated by the supply must be completely suppressed by shielding and filtering, if possible.

With the inner box removed, it is then necessary to remove the top and bottom plates which then exposes all of the works in the supply. It is desirable to replace all the paper capacitors and the electrolytic capacitor in the supply. They may not necessarily be faulty but they are hard to get at and if one was faulty, you wouldn't know it until you had completely reassembled the supply into the receiver and tried it. C48, the buffer capacitor, is important and if it is faulty, the vibrator will quickly be ruined.

The vibrator (V6732) is a 32V synchronous unit. The 32V rating is purely the rating of the reed drive coil. For example, a 6V vibrator with the same pin-outs can be used with a 32V set, providing the drive to the reed coil is reduced to 6V.

With the supply disassembled, I decided to inspect the vibrator to see if all was well with it. I unplugged it from its socket and the lug on the side of the vibrator near the plug was unsoldered. Then the circlip holding the unit inside its case was removed and the vibrator withdrawn from the case.

I plugged the vibrator back into its socket, extended the three leads to the set and tried the set out. The interference was terrible of course, but I was looking at the vibrator to see how it was performing. It seemed to be OK with minimal sparking at the contacts. I decided to run a small points file through the points to clean them, being careful not to bend anything. I couldn't increase the HT voltage by any significant amount so I left things well alone and reassembled the vibrator. New vibrators are expensive if you can get them and the voltage wasn't down significantly.

I reversed the procedure for dismantling the supply and threaded the three wires back through the hole at the bottom of the larger shielded box. The leads were re-attached and the set tried out again. There was still some vibrator interference in the set and being a purist, I wanted to eliminate it. However, I've not been able to completely cure this small problem.

Alignment

The set is easy to align, with all adjustments quite accessible. The IF is 455kHz and the two bands are broadcast and shortwave (6-18MHz). There are no adjustments for the low frequency end of the dial for the RF or antenna coils. This makes alignment simple but does mean that the performance may be lacking on the low frequency end of each band. However, with such high sensitivity it does not appear to matter. I have tried adding small ferrite slugs in the antenna and RF coils and a slight improvement in performance is observed – whether it is worth the trouble to modify the set in this regard is questionable though.

The alignment procedure is quite conventional and has been covered in other articles. Basically, you adjust the IF transformers for maximum reading (on 455kHz), as measured with a digital multimeter (DMM) across R13. Adjust the oscillator coil slugs near the low end of each band and the oscillator trimmer near the high frequency end of each band. The RF and antenna coils are only adjusted for peak performance (as shown on the DMM) towards the high frequency end of each band.

There is one interesting little quirk with the physical design of this set. The wave-change switch has a right angle drive from the front panel (see accompanying photograph). I'm not sure why AWA did this but it does work quite effectively.

Aesthetics

The AWA 532F receiver is quite attractive as a large mantel radio or a medium-sized table set. The cabinets came in at least two colours: cream and brown. The control knobs on each end of the set had a celluloid sheet with two holes in each which slipped over each control spindle. The control functions are printed on the celluloid in white. Mine are missing. I painted the control functions on the front of the set many years ago, but they do look unprofessional.

I am thinking of typing up some labels on the computer and then copying them onto a transparent sheet via

Photo Gallery: Stromberg Carlson D70 & 1935 Essanay

Manufactured by Stromberg Carlson in 1939, the D70 is an example of a universal set designed to run from either AC or DC mains supplies. Because one side of the mains was connected directly to the chassis, extreme caution had to be exercised when servicing these sets. Today, they are best operated via an isolation transformer. The set used the following valves, with their heaters wired in series: EK2G frequency changer, CF2 IF amplifier, CBC1 1st audio/detector/AVC amplifier, CL3 output, CY2 rectifier and a C1 Barretter. (Photos and information courtesy Historical Radio Society Of Australia).

The Essanay company was established in South Melbourne in the 1920s, initially as a manufacturer of radio components. The company subsequently expanded into the design and manufacture of domestic radios in the mid-1930s but apparently closed down prior to WW2. The receiver shown here is a "Tombstone" model from 1935 and sold at the time for 17 guineas (ie, £17-17-0). It covered both medium and shortwave bands and used (mainly) the following Philips "P" base series of valves: AKZ frequency changer, AF3 IF amplifier, ABC1 1st audio/detector/AVC amplifier, AL3 output and a 1561 or 80 rectifier.

a photocopier. Whether the sheet will be stiff enough I've yet to find out. The labelling will be the wrong colour, but will look better than my hand-painted labels of several years ago.

Before reassembling the receiver, I gave the cabinet a good clean with auto cut and polish compound. It really brings up Bakelite cabinets and gets rid of minor scratches.

A less fortunate 532MF

Quite recently, I saw another 532MF that had been converted to AC operation. I was rather dismayed at how it had been done. The dial drive system had been incorrectly strung, with the pointer going the opposite way to convention. Other faults included an intermittent IF valve; twin-core power cord joined just out the back of the set (dangerous); on-off switch not wired in and the cabinet was missing.

The alignment was out as well and one IF transformer appeared to be faulty. I gave it a very quick (aural) alignment (I was just visiting and had no tools) and got quite an improvement out of it. However, it was dirty and generally it was a sad set. What a shame. With a little tender loving care this could once again be a first class operational set. I felt like saying "Can I have it, please?", just to give it a good home.

Summary

The AWA 532MF radio is a straightforward 5-valve dual-wave design of quite high sensitivity. They are relatively easy to restore, with the vibrator power supply being the most awkward part to refurbish. From my experience, they require more maintenance than the Operatic equivalent. They are one of the more pleasing Bakelite sets to look at and well worthwhile having in a collection even if no 32V power source is available to run it.**SC**