Refinishing Wood Radio Cabinets – Part 2 of 3
Repairing Damage

By Mark Palmquist

In the last issue we talked about types of wood finishes: (evaporative = lacquer) and (reactive = varnish). We also discussed methods of removing the old finish, with a preference toward chemical methods over sanding, to preserve the fine details and edges of veneers. In this installment, we will discuss methods of repairing damage like dents, cracks, gouges, stains, missing veneer and separated veneer.

Repairing Dents

Wood is composed of tubular (vascular) cells whose job in the forest was to move water and nutrients from the roots to the leaves and back to the outer, growing layers of the tree. When the tree is cut and the wood is dried, these cells are mostly hollow but have strong cell walls that give wood its structure and strength.

If you strike wood with a dull object as might happen if you smack the Electrolux into the base of your Zenith Stratosphere, the high local pressure will compress some cells, leaving a dent. If you strike wood with a sharper object such as a knife or nail, the cells are severed, resulting in a scratch. A very deep cut or scratch that removes layers of cells is a "gouge".

A dent can be reversed in many cases by "steaming", to force some water into the collapsed cells and help them regain their shape. Simply dampen a cotton cloth and place it on the dent and touch the tip of a steam iron over the dented area. The iron will boil the water in the cloth and force it into the dented wood, restoring it to its former shape. You might want to try this on some scraps of wood before going to work on your radio. This technique works a lot better if the finish is removed, since a layer of lacquer or varnish will slow down the water penetration. In many cases, the dent will disappear completely ala the "Dent Wizard" ™.

Removing Scratches in the Surface Finish

A scratch that is in the film finish and does not go into the wood itself is easier to repair that one that goes into the wood and severs the cells. Flexner [1] cites several ways to repair this type of damage:

1. Apply a coat of paste wax or oil/varnish mix (such as Watco) to the surface and wipe off the excess. Remember that paste wax is not permanent and will be removed by solvents used in furniture polish. The oil/varnish mix will be more permanent.
2. Use 0000 steel wool or 600+ grit sandpaper to gently cut through the top layer of the film finish and cut it down to the unaffected finish below. The finish may be only a few thousandths of an inch thick, so proceed very slowly. If you get down to the bare wood, you might as well remove it all and start over with bare wood.
3. Apply another coat of the original finish. This works especially well with evaporative finishes such as lacquer, where the new finish dissolves and mixes with the film of

the original finish. A special type of lacquer called "padding lacquer" is often used to touch up existing lacquer finishes often found on radios. If the old finish is polyurethane, be sure to rough up the surface a bit with 320 grit sandpaper to give the new coat some extra surface area to improve the bond. Clean the surface with naptha or mineral spirits of remove any oils or furniture polish that will prevent proper bonding to the old finish.

4. The most elegant way to restore an original finish on a valuable radio such as a Zenith Walton's is "French Polishing". This is a relatively time consuming and expensive process and is best used to gently restore an original finish without removing the fine cracks and patina of age found in priceless antiques. David McDonald of Tara School House Antiques in Georgia has used this method to restore several radios for SARS members. We hope to invite him to a future monthly meeting to explain the process and perhaps show off one or two of his restoration projects. A detailed description of French Polishing can be found in *Understanding Wood Finishing* by Flexner, available at Highland Hardware (www.highlandhardware.com) or on line at Barnes and Noble (www.bn.com) or Amazon (www.amazon.com).

One use for basket case radio cabinets is to use them as "target practice" to try out your repairing and refinishing skills.

Removing Water Rings

Water rings are another common occurrence, especially when Uncle Waldo decides to use your pristine Philco chairside to park his frosty mug of Bud. The cloudy appearance of water rings is caused by moisture which penetrates and condenses under the finish. Flexner suggests three things to try:

1. Try replacing the water with oil by rubbing furniture polish, Vaseline or mayonnaise[!] into the finish. This might not always work, but is easily reversed by cleaning up with mineral spirits. The chemical action is to put something in the finish that has more affinity than water to the film.
2. Wipe the stain gently with a soft cloth dampened with a small amount of denatured alcohol. Alcohol dissolves shellac and acts somewhat like a gentle refinsher. This works most of the time.
3. Cut through the finish with a very mild abrasive such as toothpaste, cigarette ashes mixed with water or oil, pumice or rottenstone. Pumice and rottenstone are traditionally used to rub out high end finishes on pianos or high gloss table tops. I haven't tried this myself so would want to practice the technique before trying it on a prized cabinet.

Repairing Deep Scratches and Gouges

This type of damage is most often found on radios that have traveled to 20 or more swap meets in the back of a pickup with other loose cargo such as livestock or assorted landscaping equipment. Here the wood is missing or severed, and it's necessary to add some material to get the gouge level with the surrounding area. Professional finishers use solid blocks of colored shellac or lacquer called "burn in sticks". The trick is to match the color, either by having a large kit of sticks or by mixing basic colors together to get a match. These are melted with a burn-in knife heated electrically or over a clean flame and pressing it into the void. Once it cools, it can be leveled with 320+ grit sandpaper on a very flat cork sanding block. The trick is to get the blob level without taking out the surrounding finish and making an even bigger mess. Excess burn-in material can

also be removed with a clean, heated burn-in knife. Putting some Vaseline around the damage area can prevent the stuff from sticking to and gunking up undamaged areas. The final step is to add some color and grain lines the try to make the patch invisible. Buy the book and practice!

Alignment of AM Superheterodyne Radios

By Mark Palmquist – Part 2 of 2.

Last time we talked about tweaking the Intermediate Frequency (IF) transformers to tune the receiver to a frequency that is the difference between the radio station frequency and the oscillator frequency. On most radios the IF is around 455 KHz. The second part of the alignment process is to get the oscillator to track with the RF section of the tuning capacitor so that the difference between the frequency on the dial and the oscillator is equal to the IF frequency. For simplicity, we will assume the IF is 455 KHz.

Radio Tuners

Most home radios are tuned with a variable capacitor with two sets plates that rotate and mesh together. The moving plates of a capacitor are called the "rotor" and the stationary plates are called the "stator". The antenna coil is part of the resonant circuit of the RF section and the oscillator coil is part of the resonant circuit of the oscillator section.

The front section usually tunes in the RF carrier and the rear section is part of the oscillator circuit that is supposed to oscillate 455 KHz above the frequency of the station you are listening to. At 640 on the dial the oscillator is supposed to work at (640+455) 1095 KHz. At 1530 on the dial (WSAI, my favorite nighttime station), the oscillator should be operating at (1530 +455) 1975 KHz. If you have a radio that booms in stations at the low end of the dial but can't find much at the higher end, chances are things will improve with a proper RF alignment.

If you watch the capacitor while tuning in a station, you will notice that at the low end of the AM dial, the plates are mostly meshed together. At the high end of the dial, the plates are mostly separated. The more the plates are meshed together, the higher the capacitance. If the capacitance increases, the oscillator frequency decreases.

Ever wonder why the stations are scrunched together at the high end of the dial while they are more spread out at the low end of the dial? The capacitance is proportional to the surface area between the plates of the capacitor. If the plates are barely meshing, at the top end of the dial, a one-degree rotation of the dial can double the area between the plates. This makes for a big proportional shift in capacitance, meaning a big change in oscillator frequency. At the low end of the dial, the plates are mostly meshed together, so a one- degree change in the position will make a much smaller proportional change in the capacitance. That's why you have to move it farther at the low end of the dial to tune in the next station.

Alignment Procedure

If you are familiar with Rider's manuals (available on-line at www.nostalgiaar.org) for old radios, they almost always have alignment instructions that go something like this for the RF alignment:

1. Couple an AM signal generator to the antenna with a 0.01 microfarad capacitor, or by making a wire loop with the signal generator output and placing it near the loop antenna of the radio. This creates a local AM radio station with a predictable modulated signal, such as a 400 Hz sine wave. Modulation for alignment is usually set at 30%. If you look at the RF signal on a good oscilloscope, you will see the RF carrier with an "envelope" that follows a 400 Hz sine wave.
2. Check the radio dial to be sure that the pointer at the top of the dial and the bottom of the dial is symmetrical. Often radios will have an index mark which shows where the pointer should be at the extremes of the dial motion. Sometimes the dial can slip on the dial cord and it necessary to temporarily loosen the pointer from the cord and move it along the cord so things are spaced equally at both ends of the dial. Don't forget to tighten up the pointer on the dial string if you find that it needed to be moved.
3. Set the signal generator to a frequency near the top of the dial, typically 1500 KHz. Set the radio pointer to this frequency. If the signal generator is putting out enough signal, you will hear the 400 Hz tone somewhere as you tune near the top of the dial. In this step, we will be tuning the oscillator so that it works at 1955 KHz when the radio is tuned to 1500 KHz.
4. The radio diagram will show where the oscillator trimmer is located. Often it is the little screw on the rear portion of the tuning capacitor. Set the dial to 1500. In most cases the tone will be weak or not even present. Tweaking the trimmer capacitor will change the oscillator frequency and the station will be heard.
5. Connect an oscilloscope or AC voltmeter (preferably analog with a moving dial!) to the speaker terminals. Adjust the oscillator until the 400 Hz tone is maximized. Normally this step is performed with the volume control at maximum and the signal generator putting out the smallest signal that can be detected and seen on the scope.
6. Move the dial down to 600 KHz and set the signal generator to this frequency. Tune around and you will normally hear the tone. Many radios will have a "padder" or coil that can be adjusted to tweak the oscillator at the low end of the band without affecting it much at the high end of the band. Tune the radio to 600 KHz and tweak the padder to max out the signal.
7. Often the instructions will tell you to go back and check things out at the high end of the band and make a small adjustment if necessary to line things up at 1500.
8. The next step is to adjust the RF section so that the best reception is received at an intermediate point on the dial, typically 1400 KHz. Set the signal generator to 1400 and tune in the signal at that spot on the dial. The front part of the tuning capacitor will usually have a trimmer that will enable you to max out the signal at 1400 KHz. This is often called "trimming the antenna", since the antenna coil is a part of this resonant circuit.
9. In most cases, you can get your radio to work better than when it left the factory, simply because you can probably find better equipment at swap meets and hamfests than the radio builders had at their disposal back in the 30's and 40's.

President's Page – By Richard Rodgers

Thank you for having the confidence to elect me as your new 2003 President. I am delighted that Reed, Bob, Frank and Mark will continue to play a significant leadership role in our club. You have our commitment to making your membership a fulfilling experience. Your suggestions will always be warmly welcomed.

Please be sure to thank Gordon Hunter for his tireless efforts as SARS President for many years. Not only has Gordon been an outstanding leader, his passion for the hobby is obvious and

contagious. I'll certainly rely on his experience and suggestions to guide my thinking as your new President.

I believe our most important goal is to increase SARS membership. In addition, I'd like to see more of our current members attending the monthly meetings at the Piccadilly Cafeteria in Norcross. I've got lots of ideas and look forward to the challenge of increasing our membership in the coming months. By the way, I'm hoping our new web site, www.sarsradio.com, will help us attract some new members as well.

Some of you might know I've recently moved to Atlanta from a small town in Ohio near Cleveland. I became interested in radios while listening to my grandfather's old Silvertone console as a child. It had one of those big "telephone finger tuner" wheels that my sister and I tested on a frequent basis. That old console has been parked in my parent's attic in Pennsylvania for the past 30+ years. The knobs and dial escutcheon are missing and the cabinet would be a serious project for anyone.

I was always on the prowl for a nice old console radio during my regular visits to antique stores in Ohio. It would be nice, I thought, to find a restored radio like grandpa's old Silvertone as a conversation piece. I noticed one dealer at a consignment shop always had a nice assortment of antique table radios but never a floor model. Several months later I asked the shop owner for the dealer's name and contacted him to see if he had anything for me. Guess what? Within two weeks I owned two wonderful consoles in perfect condition- a Philco and a Zenith for only $125 each. The dealer's name was Stan Ward and we've become good friends over the past four years. I was especially "hooked" after seeing his personal collection of wood and bakelite radios…. hundreds of them fill his home and office. Stan, like Mark Palmquist and Charlie Pierce, is a master craftsman with wood. He's turned some of the worst dogs into beautiful works of art.

Stan also introduced me to the Estes auctions in Seville, Ohio (about 6 miles from my last home). Gosh, I certainly miss those wonderful auctions where they sold hundreds of gorgeous antique radios from early in the morning to late in the afternoon for bargain prices. Richard Estes auctioned the famous Ralph W. Muchow collection in 2001 (check out www.estesauctions.com for those unbelievable pictures).

Well, that's how I got caught up in this hobby. I love to look at radios and wonder about their past. What family discussions did they overhear? How many children and adults anxiously tuned into those famous shows during the golden age of radio? Did they hear about the December 7th attack on Pearl Harbor and President Roosevelt's address to the nation? Did their owner track the events of WWII each evening? Why did someone keep this obsolete relic instead of pitching it into the trashcan during the 1950's? I'm delighted these historic items remain with us today.