

Radio Cabinet Restoration - Part 2

BY JOE KOESTER

In Part 1 Joe discussed techniques for dealing with a damaged cabinet, e.g., veneer repair.

Here he describes staining and final finishing.

Staining

There are about as many stains as there are opinions, and each has its own merits, but I found one brand that I think is particularly good—the solvent or alcohol-based Behlen stains. Behlen is a subsidiary of Mohawk, a major manufacturer of finishing and refinishing products. Unlike waterbased stains, these will not raise the grain in the wood by swelling. They go on quickly, don't use up much material, are easy to work with and dry quickly. What more could you ask for? Specifically, ask for Behlen Master Solar-Lux Non-Grain Raising Stain. Behlen offers a number of different colors. I like the Medium Brown Walnut (B503-6A205) and Nutmeg (B233-66666) but there are many other colors to choose from. I have some Jet Black and Blood Red, and any and all of these stains can be mixed to achieve a different color. Other stains I have used include Formby's, Carter Tripp, and Lenmar from Baltimore. But to my way of thinking, you can't beat the Behlen stains.

Application: This is fairly straightforward. I usually pour a small amount in a container and apply with a clean paintbrush, reserved only for stains. Work it into the grain and make sure all surfaces are covered. Like the stripper, avoid applying it to the top and letting it run down the side as you may end up with uneven applications and visible runs. I usually go over the radio twice and then dip a rag in the stain (use gloves by the way) and wipe over the entire surface. Wipe in a circular motion to cover the surface evenly, but always end up wiping *with* the grain. This stain dries quickly. Behlen claims you can put a final finish on the cabinet after an hour, but I always wait at least a day. Brushes (and sometimes your hands) clean easily with warm water and some hand soap if you need it. If you use other products follow their recommendations, but this method seems to work well with most stains. Just be sure to wipe it down with a rag with stain before you put it aside and you will have an even finish.

Filling the Grain: A critical step in making your radio cabinet refinishing a professional job is to fill the grain. Much of the wood used in radio cabinets is open-grain wood, e.g., walnut and mahogany. The veneer is flat but has minute valleys that must be filled to allow a smooth professional finish. I like to use darker or tinted wood filler that fills these valleys with a dark material and gives the wood a very smooth finish—and the contrasting filler beautifully highlights the grain. There are distinctly different kinds of wood filler. The first category consists of substances like Plastic Wood and DAP Wood Dough or Wood Filler. These are designed to fill actual holes or larger gouges in wood. They are invaluable in filling cracks between veneer seams, small nicks out of the back of a cabinet, or other such minor repairs. The “wood filler” used to fill the tiny valleys in the grain is a completely different animal—wood *grain* filler. It is a paste-like substance applied with a brush, normally with the grain to get the maximum amount in the pores. I have had success with Bartley's dark walnut, but have been unable to find it recently, and now I use Behlen's Paste Wood Filler (Medium Brown Walnut). It should run \$12 to \$15 for a quart, but if you aren't going to do too much cabinet repair, get a pint or even a half-pint if available. Apply it following the directions on the container, and then after the recom-

mended interval, remove it *across* the grain so as not to pull it from the pores. You must remove the excess filler at the right time, and you have only a small window of opportunity. If you remove it too soon you will remove too much. If you take too long, it can set like concrete. It can be softened with mineral spirits, but put it on and remove it properly and you will see instant results. I use a flat-blade plastic paint scraper to scrape it off, or an old credit card. Wipe the scraper after every pass. Some people prefer to wipe off the filler with burlap. You can toss out the scraped off filler or even put some back in the container. Scrape the excess filler off properly, and you will notice a sheen on the finish. You have just succeeded in making a real difference before you even apply a final finish.

Update: Recently I have been unable to find the oil-based wood grain filler, which I prefer. It seems that everyone has switched to water-based fillers, which I will soon be forced to try. When you purchase water-based wood grain filler make certain it is tinted dark (walnut usually) or that stain can be mixed with it to tint it dark. For best results use a color darker rather than lighter than the stain on the main veneer so as to contrast and highlight the grain.

Options: Spray nitrocellulose lacquer was the final finish coat on almost all radio cabinets from the mid-1920s through the 1950s, and that is what you should use, both because it makes for an authentic restoration and also because it is the most convenient finish to use. It dries quickly so that multiple coats can be applied the same day. You can apply the wood grain filler right after the stain, and before the first coat of lacquer, and this is what I usually do. However, another option is to apply the first thin coat of lacquer and then apply the wood filler before subsequent coats. If you apply a tinted or darker wood grain filler over the unsealed cabinet it will tend to make the cabinet darker by bleeding a portion of its stain over the lighter stain already applied. This may or may not be a bad thing. I tend to like the slightly darker finish on the cabinet. On the other hand, if you achieved the precise coloring you intended with the initial application of stain, then by all means shoot a coat of lacquer or sanding sealer over the cabinet before you apply the wood filler. It will then fill the grain and will not bleed over on the other portions of the wood. Another option is to apply sanding sealer—a clear lacquer with an agent designed to help fill the pores. I have used it only a few times and do not claim to have mastered the art of sanding sealer. If you wish to try it, spray a thin coat, then sand with very fine sandpaper (400 or 600 grit) to level the surface, then spray another coat, or proceed to the final lacquer finish. Several coats of sanding sealer can be applied, and will fill the voids in lieu of the wood filler. The difference is that sanding sealer will retain the original coloring of the stain without the contrasting and darker wood filler. Regardless of which approach you choose, when the grain has been filled, apply the first coat of lacquer. I always use Deft Semi-Gloss lacquer for the final coats, and I always spray it on with my touch-up spray gun. The newer cans of Deft refer to it as a “brushing lacquer.” I was concerned when I recently contemplated the purchase of another can. I called the company and they assured me that their formulation had not changed. They were suggesting it be applied by brush rather than by spray gun to reduce the “amount of volatiles released into the air.” So Deft is still Deft.

A Mistake: Sometimes when sanding over a sanding sealer (a thin coat of lacquer), you can accidentally penetrate through the finish and sand into the stained wood. If that occurs and the mistake is evident, apply a touch of the matching Behlen stain and then continue to apply the finish coats. I have even sanded through multiple layers of lacquer when doing the high gloss finish (see Epilogue), but it is possible to touch up at that point and add more lacquer. Remember that the cabinet must always be clean and free of wax, so if you need to apply more lacquer, lightly wipe the cabinet with mineral spirits to remove the wax and allow it to dry. Then wipe the cabinet with a soft cloth before putting on more lacquer. Do not use lacquer thinner or you will remove much of the final finish and can create major problems.

Graining Pen: This is essentially a small, sharp-pointed pen filled with toning lacquer. It is used to simulate the random patterns of grain where none exist or where you need to blend in or hide a veneer patch that stands out. Graining pens are available at woodworking shops. Simply draw a grain pattern on the wood to help match it. This is normally done after the staining and wood filling, but before the application of the final lacquer finish.

Toning: This is a *second critical step* that will make any radio look like a million dollars. Toning is the application of different colored lacquers to highlight areas of the cabinet, to cover plain or grain-less woods, and to shade different areas. Typically, the base of a console will be darker than the rest of the radio, and a medium dark walnut, extra dark walnut, Van Dyke brown, or some such color will work well. These come in spray cans and are applied directly to the cabinet area. Remember you have already sprayed one coat of Deft over the cabinet. This seals the wood and after a day or so of drying you can mask the areas to be toned using that wonderful blue masking tape and then taping newspaper to keep over-spray off the rest of the cabinet. Apply the toning lacquer in very light passes, only a little at a time. If you apply it too heavily, drips or runs will result, and they will have to be removed or they will show! Multiple passes will build up the tone to somewhere close to the original or to what is pleasing to your eye. If you apply it lightly you don't have to worry about it bleeding under the blue tape—another good reason for a light touch. In addition to bases, many cabinets have areas of plain wood trim around the top, shoulders, or strips running up the front. Typically these trim pieces need to be toned because the wood lacks character, and without toning, would detract from the otherwise nice finish on the cabinet.

Detailing: In addition to toning there are a few other areas of the cabinetry that require a little extra effort—work that will pay big dividends. One is speaker grilles. Many radios have ornate cut-out grilles. The procedures above create a nice finish on the front surface, but what of the edges? They will show too, and can be dressed up easily. If there is a rough edge from, say, excess stripper sludge, it will show up during the sanding of the cabinet prior to staining. Much of the grille work will have to be sanded on the edge *across the grain*, so use caution so as not to dislodge the thin grille veneer, which is susceptible to damage during sanding. Use medium (150 grit) and fine (220 to 240 grit) to smooth this area. At this point the cabinet has been covered with a first coat of Deft lacquer and the toning lacquer has been applied. The next step involves an artist's product called gesso to cover the edge of the grille. Gesso (basically, color tinted plaster of Paris) is used by artists to cover a canvas to provide a smooth and colored finish prior to painting. It comes in black, burnt umber (brown), and white. There may be other colors available, but I use black and brown. Try to determine which color had been used on the radio originally. Most speaker grilles were black on the edges, but some sets, such as the Zenith Walton sets, had brown edges on the speaker grille. Gesso is water-based and dilutes well. Put a little on something like the plastic lid of a margarine or Cool-Whip container. Use a small paint brush, ¼-to ½-inch wide, and have a container of water and paper towels available. Paint the gesso on the raw edge and use a damp towel to remove any excess from the finished front of the grille. It is much easier to remove if there is a coat of lacquer on the wood. If the gesso is applied before the lacquer, it can bleed into the pores and can be tough to remove. I have used brown gesso in place of toning lacquer on trim on a tombstone or two, as well as on the base of a tombstone. I recently used black gesso on the very bottom of an Atwater Kent console, and for various trim pieces on a cabinet. When the gesso dries it has an unappealing flat finish but the final coating of Deft will cure that.

Special Effects: Another way to achieve a “blended finish” is to use an air gun to spray lacquer tinted with the stains I mentioned. An air gun is simply a much smaller version of a paint spray gun; it puts out much smaller patterns of spray and allows for exact placement of the colored lacquer. An air gun provides precise control over the application of stains, stain and lacquer mixtures, and clear lacquer for small applications. If you have seen feathered finishes where a darker finish bleeds off or blends into the surrounding finish, chances are it was done with an air gun. Air guns use very low air pressure and volume and can even be powered



Applying gesso to a speaker grille.

by an aerosol can of air. You can buy several cans of pressurized air and need no additional equipment, or you can purchase a miniature compressor designed specifically for an air gun. The sprayer is attached to a small (one ounce) or larger reservoir. It allows great freedom of movement and expression. In essence you are making your own toning lacquers, and can obtain the same or better results than possible with spray cans. Pour a little Deft lacquer in a small clear glass container and add the desired stain. Remember to stir the Deft well before pouring it, and stir the stain as well in the smaller container. You can even apply darker stains over existing stains before you ever put the first coat of final finish or Deft over the cabinet. But I prefer the tinted lacquer best.

Spraying Lacquer

Conditions: Lacquer must be sprayed when the humidity is below 70 percent. The first time I sprayed lacquer in Maryland it must have been in the 90 percent range and my Atwater Kent cathedral turned white! Lacquer picks up the moisture in the humid air and captures it, hence the white finish. There are agents that can be added to the lacquer to speed up drying time or retard it, but I have not found them necessary. I normally spray outdoors, but not when the dandelions are winging their way about or there are swarms of small insects, which are always drawn to the smell of fresh wet lacquer and land for a sample. So if you don't want amber on your radio, take heed. Have your cabinet finishing jobs saved up and ready to go for that nice day with low humidity and temperature in the 60s or above. When the weather conditions are ideal it makes sense to spray several radios at once, as in the picture. You can see that no toning or detailing was done. After this first application dries for a day or so you can work on the toning and detailing. Remember to mask off adjacent areas when you spray the toning lacquers to avoid over-spray. When detailing with the gesso you normally needn't mask surrounding areas as you can easily wipe off the gesso with a damp paper towel.

Application: This is a very easy way get a killer finish on a radio. I use a little “touch up” gun that holds maybe a half pint of lacquer. I always use the Deft semi gloss lacquer and set the air pressure to around 65 pounds—you will need to experiment with your particular gun and adjust the flow such that the pressure is not too high. The lacquer flow rate is also adjustable. If the air pressure is too high, it will result in a bumpy orange peel finish, so cut the air down. If the spray is mostly air, increase the flow of the product until you get a uniform pattern emerging from the gun. Most air guns have an adjustment for a horizontal or a vertical fan pattern. I use both, but most often vertical, which covers a larger area per pass on, say, a console.



Never spray lacquer on a humid day. Save up your cabinets and wait for a clear, sunny day with low humidity and no wind, and then do several at a time as I did here. That way you have to clean your spray gun and other tools only once, instead of multiple times.

Like the toning lacquer, spray the finish lacquer on lightly and in multiple passes. On a day with favorable humidity and warm temperatures, when you have finished spraying the first coat on the cabinet it may already be dry in the area where you started. Resist the impulse to spray on a heavy coat or you will find out what “sags” or runs are. Six or eight coats will usually be plenty. When you get the feel of the gun and have done a few radios, you will learn that you can spray a couple of fairly heavy coats *if* the weather conditions are ideal (really quick dry). Otherwise, it is sag and run. By following these directions, your radio is going to look super, but *take your time!* Spraying is really very simple, slow and easy. When you are done be sure and clean the spray gun. Fill the container with lacquer thinner and spray it into the air (not near the radio or neighborhood kids and dogs!) and wipe the exterior off with a wet paper towel or rag to remove any dried lacquer. I have been using my gun for nearly twenty years and I have a new back-up in reserve. They are available at places like Harbor Freight and probably cost \$25 to \$30, though I haven’t priced one in years.

Option: In the wintertime you can’t spray on a cold day, even if the humidity is low. Lacquer has an application temperature range, and spraying on a day near freezing isn’t advisable. While spraying lacquer inside is dangerous and not recommended, I must confess I have done so more than once in my two-room workshop, separate from my house. Spraying in one’s basement is a mistake because the fumes will smell up the entire house, in addition to the fire and explosion hazard. What I have done is heat my two-room workshop up and turn off the gas heaters (pilot lights too!). I move the compressor into the second room and shut the door. You require a neutral environment with no chance of sparks igniting a room full of highly volatile lacquer overspray. Even a spark from turning on a light switch or a static discharge from stroking a nylon jacket could possibly lead to an explosion or fire. Also, when spraying indoors, you must wear a respirator as the fumes are highly toxic. I spray the cabinets as mentioned above. Then I quickly move them in the other room, shut the

door, open the doors and windows in the room where the spraying was done, and air the place out thoroughly before relighting the heaters.

Lacquer Tinting: One of the nice things about the Behlen stains and the Deft lacquer is that they are very compatible. The two can be combined for touch up or in a coat or two of the lacquer finish.

Mixing Multiple Stains: Let's say you have prepared the surface and stained and filled the wood, and sprayed a coat or two of lacquer, but you aren't quite happy with the color of the radio—you might like it slightly darker. Take some of the stain you used, mix it with the Deft

lacquer, and spray another coat over the cabinet. You can apply multiple coats if you wish, or you can add a little more stain, or perhaps introduce a bit of a different color or darker Behlen stain to the Deft. If you started with nutmeg but want it darker, try some medium dark walnut, or a touch of mahogany, or maybe a very small amount of hickory, or even an eyedropper of jet black (careful here). To darken mahogany or cherry, add some blood red. Add a touch of blood red to the walnut to give the cabinet a warmer reddish tone. Tinted Deft can even be used for touch-up where the stain may not be quite even. Since the finish has been sealed with a coat or two of clear lacquer, you can go back and touch up here and there if necessary.

Finishing Up

After the cabinet has dried for a day or two, go over it lightly with some 0000 steel wool. This will smooth the lacquer finish and will turn it somewhat dull in the process. Again be gentle; you want a smooth finish and don't want to bear down hard, especially on the edges where you can end up going through all the lacquer. You will see white lacquer residue in the steel wool. Shake it out occasionally. As always, wipe with the

grain. When I finish with the steel wool, I blow the cabinet clean (an air compressor is a wonderful addition to any shop!) and wipe it off with a clean T-shirt or soft towel. Then I apply a coat of Antiquax (described in Part 1 of this article) and buff the cabinet. You will be surprised at the nice finish you get using these methods.

Epilogue

Another Option: Before you wax that cabinet you might like to go a step further and get a high gloss piano finish. A colleague and I addressed this technique several years ago in the MAARC Newsletter (October 1996, p. 10) and called this method the Fine Abrasive Restoration Technique. If you choose this method, finish the cabinet with Deft high-gloss lacquer rather than semi-gloss. Essentially what you do is continue to



Here is a close-up of some of the cabinets I sprayed on a perfect weather day. You can see the deep shine even in this photo.

sand the finish with increasingly finer abrasives, starting with 400 grit and continuing to 600, 1000 and 1500 grit, using wet and dry paper. Use water or paraffin oil as a lubricant. After the finest grit wet and dry paper, progress to a fine pumice, and finally to rottenstone. The cabinet will shine like a new penny. I have seen people get excellent results with tung oil, but I have never tried it. There are far too many methods and products to attempt to address all within the scope of this article. Perhaps another MAARC member will follow up and tell us about using tung oil. As stated before, this article is simply one man's opinions and methodology. Some of my early attempts looked like I applied polyurethane varnish with a broom. I like to think I have progressed beyond that point. These methods work for me, and I know they will work for you.



Some Recommended Supplies....listing starts on next page.

Recommended Supplies

Stains:

Behlen Master Solar-Lux, Non-Grain

Raising Stain:

Medium BrownWalnut (B503-6A205)

AmericanWalnut (B503-6A235)

Nutmeg Brown (B503-6A265)

Medium Brown Mahogany (B503-3A135)

Hickory (B503-6A286)

Golden Fruitwood (B503-4A565)

Jet Black (B503-01A45)

Blood Red (B503-3A285)

Note: TheWalnut, Nutmeg, and Mahogany stains will work for most radios. The Fruitwood is a lighter stain and can serve as a base for a stain mixed by using any of theWalnut and Mahogany stains. The Jet Black and Blood Red are used to color custom stains. The Hickory is a darker stain useful for very early cathedrals, tombstones and table radios.

Lenmar Permanent Brushing Stain:

Ebony Black (U-622)

DarkWalnut (U-617)

Note: These are also good stains and I used the

Ebony for detailing until I discovered gesso, which is much easier to control (less bleed-over) and apply. The Behlen stains are so versatile and easy to use I seldom use anything else.

Lacquer Finish:

Deft Semi-Gloss ClearWood Finish

Deft High-Gloss Clear Wood Finish

Deft Lacquer Sanding Sealer

Toning Lacquers:

Mohawk Tone Finish Toner:

Van Dyke Brown (M101-1478)

Medium DarkWalnut (M101-0234)

[Excellent for cabinet bases]

Extra DarkWalnut (M101-0209)

[Excellent for cabinet bases]

Dark Red Mahogany (M101-0227)

Perfect Brown (M101-0249)

Cherry Brown (M101-8359)

Note: You can start toning a cabinet base or trim pieces with multiple coats of a lighter toning lacquer, and if you are not satisfied with the results you can pick another can of darker toning lacquer and go over the area. You can intermix these toning lacquers for a custom look, or you can choose a darker lacquer (example: Extra Dark Walnut) to cover the first few coats of a lighter lacquer. Remember—light coatings, multiple coats!

Glues and Repair Products:

Titebond III, UltimateWood Glue
Weldwood Contact Cement
DAPWood Dough (Wood Filler),
WalnutWunderfil Dual PurposeWood
Filler, Walnut, 2 oz (from Rockler Co.)

Grain Fillers:

Behlen Pore-O-Pac Paste Wood Filler
(Grain Filler), Medium BrownWalnut
(B744-1F156)
Bartley Paste Wood Filler, Dark

Finish Restoration Products: (To enhance
existing finishes)

Howard Restor-A-Finish, Walnut
Mohawk Amalgamator (400-0006)
Old English Scratch Remover
Slagle Sauce – an equal mixture of onehalf
boiled linseed oil and one-half pure
gum turpentine. You can increase the
turpentine slightly if you prefer.

Waxes:

Antiquax
Briwax
Butcher's Wax
Blue Coral
Classic Car Wax
Mother's Mag Polish

Detailing Products:

Liquitex Acrylic Colored Gesso (Black)
[Hobby Lobby]
Liquitex Acrylic Colored Gesso, Burnt
Umber (Brown) [Hobby Lobby]

Polishing Materials: (For High Gloss Finishes)

Behlen Paraffin Oil [For Rubbing
Finishes], B740-28645
Mineral Oil
Behlen Pumice Stone, Medium Coarse 2F
(B720-1402)
Behlen Pumice Stone, Fine 4F
(B720-1404)
Behlen Rottenstone (B720-15006)

Miscellaneous:

Behlen Master Graining Pen, Brown,
Dark (B265-004)
Wood Medic Handyman's
Repair/Touch-Up Kit
Go Jo Waterless Hand Clean (cream,
without pumice)
OOOO Extra Fine Steel Wool
Crown Liquid Paint & Varnish Remover
Klean Strip K53 Premium Stripper,
thick brushable paste
Scotch 14-day ShurRELEASE,
Shurtape (Blue painter's tape),
1- and 2-inch width ■