Basic Wood Radio Cabinet Refinishing – Part Two

By Eric Stenberg

This is the second of two articles dealing with the refinishing of a vintage radio cabinet. In the first part we discussed preparing the set for refinishing and stripping off the old finish. The example cabinet, a Fairbanks-Morse 58-T-1 (figure 11), is now ready to be recovered.

Figure 11: stripped cabinet.

So, now that you have taken the finish off, it's time to put it back on. The first part to go back on are the color coats. There are basically three ways to achieve this, natural wood color, stains, or tinted lacquers. Manufacturers used all three but I believe they used tinted lacquer most. Mainly because with the other two the color will still be there after the finish is removed, though a stain could have been lightened by the process. But most of the time the color is gone after stripping which is why I suspect tinted lacquer was used. I certainly suspect this of the Fairbanks Morse Company. It also would have been the quickest, therefore cheapest, to apply. Natural wood color was mostly left only when designers were creating with exotic woods. So, usually, if you want to be completely authentic you would put the color back with tinted lacquers. Now I admit that I prefer the look of stained wood. I think it looks slightly more natural by making the color more a part of the wood. But the difference is subtle so I leave it up to personal choice. Though for corners and edge trim tinted lacquer is the only way to go because it is the only way to cover up end grain. I will talk about both.

However, I must first mention the dreaded subject of grain filler, also known as wood filler. Many of the popular woods used to make radio cabinets, such as walnut, oak, and mahogany, are considered open grained wood. The thin dark lines of the grain are really small voids in the surface. As the name of the stuff implies, the purpose of grain filler is to fill these voids. It is done to achieve a very smooth surface. If you are going to use stain you can apply the grain filler before or after. For tinted lacquers it must be done prior. Grain filler compound comes in colors similar to stain colors. Use one that is darker than your stain or lacquer for a more natural look. Grain filler has some staining effect of it's own so I prefer to use it before my color coat to see the effect. The reason I dread mentioning it is that using it is a complication that takes some practice to get right. The surface can be left with a slightly muddy look if you do not get it all off the field (the flat part of the wood between the grain voids). I also do not believe the filled grain look is a perfectly natural look. Grain filler is optional in my opinion, however, if you want a glass smooth finish you will need to use it.

Another problem with grain filler is that it is often referred to as wood filler. In fact, several brands call themselves such. Unfortunately there are other compounds that carry this moniker as well. Grain fillers are peculiar to the fine wood working community. To obtain it you need to go to Wood Workers' supply stores or mail order houses catering to the same. If you go to the home improvement emporiums, or even hardware stores, and ask for wood filler they will steer you toward various wood repair compounds. These may be more familiar to you as they often go by names such as "wood patch" and "plastic wood". These are very thick pastes used for filling holes and structural repairs. They dry hard and can be cut and sanded. These wood patching compounds do have a place in cabinet repair but not as grain fillers. These patching pastes also come in various colors like stains, but they all lighten up when sanded. Also they usually claim that they will "take stain like wood". They don't. For these two reasons avoid using them on the wood grained surface of your radio

cabinets because it will show, especially if you use stain. They are okay for edge trim that is going to be covered with an opaque coating of tinted lacquer.

True grain filler is applied as a thin paste about the consistency of pancake batter. Some brands have to be thinned to this point. Grain filler will not dry hard to where it can work for structural repairs. But it will keep it's color when sanded. Follow the instructions on the can to use it. The thing to remember is that it needs to be worked into the grain. It is one of the few times in finishing where working across the grain is best. Put a generous amount on the cabinet and use circular motions with a cloth to start. I then like to press it into the grain using a flat plastic scraper used for applying putty to automotive body repairs (found at auto part stores). Run this scraper hard across the grain. Then let the filler sit. After a few minutes, when it starts to dry to a dull sheen, wipe off as much as you can with a rough cloth going with the grain. Then let it dry overnight. The next day you need to sand off the residual. Here the instructions often say to use 220 or 320 grade sandpaper. I find it often takes starting briefly with 100 grit paper to get the heaviest deposits off, then progressing through the lighter grades of sand paper for a smooth surface. The instructions also say a second application of filler is optional but I have gotten better results doing it.

One other trick, if you want to keep the grain filler from staining the field, spray on a couple light coats of sanding sealer lacquer (regular clear gloss lacquer will also work) before applying the filler. You need to do this before each application of filler. You only have to wait a few minutes for the lacquer to dry.

A word about what sanding sealer was really invented to do. After sanding, very small pieces of wood fiber are left sticking up above the surface of the wood. They can't usually be seen with the naked eye but do negatively affect the final smoothness. Sanding Sealer was developed to seal around these and seal the flat surface to prevent more from forming with another round of sanding. The sealed fiber ends just break off and more won't form, unless you sand all the way through the sealer. Try it between the lighter grades of sand paper.

By the way, the final smoothness of your finish will be heavily influenced by how smooth things are after the sanding steps mentioned here. I highly recommend some light sanding with progressively finer paper even if you choose not to use filler.

And you will notice that there are no pictures of grain filler being used on the Fairbanks Morse. That's because I chose not to use it this time, (remember, I said it's optional). The reason was that there are some flaws in the veneer on the curved top of the radio where it appears there was some surface splintering in the past. Not all that uncommon on such curved areas. Sometimes they are complete splits. They are almost impossible to repair short of replacing the veneer altogether. On this set these flaws are not particularly bad but the grain filler would have filled them as well and made them more apparent. The final surface is not quite as smooth as it could have been but it is more than good enough (in my humble opinion).

Now to finally start putting the color coats back on. The first area to go after is the detail trim. The inside edges of the grill openings on old radios was often colored black or a dark brown. For most work lacquer is best sprayed on, and I will say more about this in a moment, but this part is an exception. Masking this off and spraying it would be a chore. Especially on fancy grill work cut outs. Thin grooves cut as decorative accents, such as this Fairbanks-Morse has, are also good candidates for detail brush work. For this I have been using Plasti-Kote brand automotive touch up paint. Other brands would probably work as well. Automotive paint is lacquer based and the touch up paints have retardant added so they do not dry to fast to brush on. I pick up a bottle of black and another of a medium brown. The black can be used straight or the two can be mixed to form a dark brown.

You want the inside edges of the grill to be dark to de-emphasize them and produce a shadow effect. For sets that have no black accent trim elsewhere I like to use a very dark brown. Figure 12 shows the grill opening being done. Trim grooves are usually black I've noticed, though a dark brown can work well here also. It is

Fig12: Coloring edge of the speaker grill opening.

hard to avoid getting some slop outside the groove. To clean this I wrap a paper towel tight around a finger and dip it in clean lacquer thinner. Hold the finger stiff and wipe it over the top of the groove without pressing into the groove, as shown in figure 13. This is a good way to clean slop off the front of the grill area as well. Next step are the main color coats.

Stains are great on the flat surfaces of the cabinets. They are not so good for the raised trim and corner edges because it is hard to keep them from wicking to the surrounding wood, which usually is a different shade. Masking off is not as effective with stain. Plus stain will highlight, rather than cover, end grain. There are various kinds of stains available. Min-Wax brand, which is popular, is an oil-based penetrating stain. On radios I prefer a non-penetrating stain. They come in water and alcohol based varieties. You can get pigments and mix your own. Water based is easy to use but it will raise the wood grain and require some fine sanding. The alcohol-based varieties are known as Non-Grain Raising (NGR). You can buy premixed NGR stains at woodworking shops. Lately I have been using a brand of color concentrate called TransTint and mixing it with alcohol myself. That way I can combine colors or mix them double or half strength for various different shades. With any stain you wipe or brush it on with the grain, wait a few minutes, then wipe off the excess. The nice thing about a non-penetrating stain is if you get it too dark you can wipe over it with a cloth soaked in the solvent, such as alcohol for what I use, and pull some of it back out of the wood to lighten it up. Stain before you do any lacquering. And, of course, it will have to dry.

Fig13: Cleaning slop over from the groove edges.

Tinted lacquers are what the name implies, lacquer that has been colored with a pigment or dye. Spray on one or two light coats and they will tint the surface while letting the grain show through. More coats will give deeper color, though you probably do not want to go beyond four or five as it gets less transparent as you build it up. Spray on multiple coats and it builds to a nice opaque surface that is great for corners and trim. Figures 14 and 15 show the cabinet edges masked off and then sprayed with the trim coats of extra dark walnut tinted lacquer. Like stains you can mix your own tinted lacquers using clear gloss lacquer and pigments. Various coloring agents such as aniline dye powder, Japan colors, or others are available from wood working supply shops. You can get your own custom colors this way but, frankly, I wouldn't bother. Tinted lacquer is available in aerosol spray cans in a wide variety of wood tone colors. Mohawk brands are the best I have found. They come in two types, Ultra, which is tinted with a more transparent dye, and Tone Finish, which uses paint type pigments and builds to opacity quicker. The only trouble with Mohawk lacquers is they are hard to find in small quantities at retail other than a limited set of colors available from some mail order houses. You can buy directly from Mohawk but only in bulk. Behlens brand lacquers are slightly easier to find at local wood working supply stores and also work well. They seem to be similar to the Mohawk Tone finish (and I believe they are made by the same company).

Fig14: Mask off the cabinet for major trim color-

Fig15: Trim with 8 to 10 coats of tinted lacquer.

Masking and spraying the trim detail and edges may be a multi step process depending on the design of the set. The trim bars on the front of the grill on the Fairbanks-Morse where done separately as the masking required extra attention.

At this point I should wax eloquent about lacquer and how it is applied. Lacquer is an excellent finish, is easy to work with, and is fairly forgiving as long as you treat it right. Earlier I mentioned it is normally sprayed on. That is because lacquer works best that way, hands down. Except for small detail areas brushing is an inferior way to apply it. Sprayed lacquer dries very quickly and a new coat can be done every 3 -5 minutes. The solvents in the lacquer soften the previous coats and cause them to flow together with the new coat. For this reason sanding between every coat is pointless despite what instructions may say. The two big rules to follow are: one, use light coats and two, do not touch it while it is wet. Light coats keep drips and runs from forming. Resist the urge to spot fix a part you missed. That is a great way to cause a drip. Build up color and thickness with multiple coats. Wait the few minutes between coats necessary to let the solvents dry off. And during those few minutes leave it alone. If you touch it, say to get rid of a drip from spraying too heavily, you will likely go straight through to the wood. This is especially nasty over a colored area. Lacquer works best in warm temperatures and low humidity. If it is cool or muggy allow more time between coats. Shellac works much like lacquer but takes longer to dry between coats, say 15 minutes or so.

If you read any books on refinishing you may notice they try to steer you away from lacquer. The problem is usually the requirement that it be sprayed. They tend to find aerosol cans inadequate and they want to save you the trouble and expense of spray equipment. This is nice of them but remember they are normally talking about refinishing large pieces of furniture. It is a matter of scale. Radio cabinets are a perfect size for using aerosol spray cans. A spray rig would be helpful for the final clear coats on floor consoles, but even there it is not vital unless you are going to do many. The other good things about aerosol cans are that set up and clean up are almost non-existent, and the propellant is dry. That last is handy in humid conditions when you would want water extraction filters on compressed air equipment. Aerosols do cost more per quart but you are not going to use a lot on a radio cabinet.

If you do want to invest in spray gear and you do not already have a compressor I would definitely recommend one of the new HVLP (High Velocity Low Pressure) units now available. I've seen them for under $200. They are a technological improvement over conventional spray equipment.

A word about safety. Spray lacquer only where there is lots of ventilation. Avoid breathing the fumes. The solvents are not your lung's best friends. I would highly recommend getting a painting filter mask if you are

going to do this regularly. And, again, the fumes will mix explosively with open flames so avoid that combination.

Figure 16 shows the colored cabinet ready for the final clear coats. If I didn't mention it before, I used tinted lacquer for all the coloring on this set. It only took a couple light coats with a medium brown walnut shade to color the top, front, and sides. Clear coating is the step most people imagine about when they think about refinishing. Once again, multiple light coats is the name of the game. I go for 20 to 25. I have been told that original manufacturers may have used even more. I prefer a satin finish as I think it gives a more mellow tone indicative of an aged cabinet. But that is a matter of personal taste

Figure 16: Overall color coat.

Here is a little tidbit I read about lacquer that I want to pass along. Apparently lacquer is naturally glossy. Lacquer makers add deadeners to get the flat, satin, and semi-gloss variations. These deadeners weaken the internal bonds slightly. For this reason I use gloss lacquer for my first 15 – 20 coats and follow up with about 5 coats of the satin. If you prefer a high gloss finish do not use the satin.

Clear coat lacquer is much easier to find than the tinted stuff. Any home improvement emporium has it as well as hardware, paint, and even auto parts stores. I like the Velspar American Traditions brand sold at Lowes. I find it works well and is inexpensive. Deft brand lacquer works well and has a very nice spray nozzle. MinWax also makes a good aerosol spray lacquer that is carried at some wood workers' supply places. Of course, the Mohawk lacquer is excellent, but pricey. Avoid the Krylon brand lacquer. The solvents are a bit too aggressive and will start washing away the color coats. Ouch.

Figure 17: Spraying the clear coat.

Spray technique (figure 17) goes like this. Work on one surface (top, front, or side) at a time starting at the top edge. Hold the can or spray gun 8 to 10 inches from the surface. Aim to one side of the cabinet and start spraying. Move onto and across the surface in a horizontal line parallel to the surface. Keep spraying past the other side. The motion should be smooth , steady, and fairly quick. About one second to cross the face of a radio like the Fairbanks-Morse. Don't pause in the middle of the stroke. For the next pass aim at the lower edge of the spray swath from the previous pass. This will become hard to see so just make an approximate guess. Keep doing this until you have sprayed the bottom edge then move on to the next cabinet surface. Do not go too slow. Do not worry that you missed a spot, you will get it next coat. Do not go back and "spot fix" a section. Runs and drips are your enemy as they are tough to fix. After you have done all sides wait about 3 to 5 minutes and do it again. As said before, adjust dry time for temperature and humidity. Below 55 degrees the process generally does not work well. After the last coat I let it sit overnight at least. Lacquer dries fast but takes longer to thoroughly out gas and harden. Figure 18 is the refinished cabinet.

Figure 18: the finished clear coat.

Let me revisit the topic of sanding between coats. The spray technique I described above makes for very thin individual coats, which is another reason to not sand between them. I have tried stopping every five or ten of these coats to sand. In theory this should help with the final result by taking down the minor imperfections from the spraying (which can leave that "orange peel" effect). This jury of one is still out on just how much it helps as an intermediate step. It does add time since to do it "right" means stopping to let the cabinet fully dry overnight and then wet sanding (see below) with a fine grade of sandpaper, such as 400. Then you have to let that dry well before resuming the lacquer spraying.

The last thing you want to do is rub the finish out. Basically it is a polishing meant to take out minor roughness in the last coat of finish. This is not my favorite step since if you have a good smooth surface to begin with I don't think it always buys you a lot, especially on a satin finish such as I prefer. It is more important for a high gloss finish and you can't honestly claim a hand rubbed lacquer finish unless you do it, I guess. Traditional materials for this are pumice and rottenstone mixed with water or oil. I prefer more modern abrasive items such as #0000 steel wool or very fine grit (400 – 600) sandpaper. Either can be used wet or dry. Wet sanding involves using a lubricant such as water, turpentine, or mineral oil and is safer than dry sanding at this point, so is preferred. Lately I have preferred the results I get using #0000 steel wool dipped in mineral oil. Rub the cabinet surface with the grain and be very careful not to get too aggressive, especially if dry sanding, or you will grind through your new finish. Remember you are only trying to smooth out the final surface. If, indeed, manufacturers originally used many, many coats of lacquer, this may well be the main reason. It is an area I intend to experiment further with. If you use mineral oil you can clean the excess off with mineral spirits (paint thinner). Plus this gives you one more drying step to look forward to.

You may have read about folks who use many successive steps of wet sanding with very fine grit sandpaper such as 1000 down to 4000 grit. Then they finish with a good furnisher polish or automotive type paste wax. They do this tedious work to get the super high gloss, mirror-like "piano" finish you sometimes see. It is impressive when done well. It is also a bit of an art and would take some practice. Personally I am not convinced it represents the way the radios looked when they left the factory. It is actually too good. Though some high end consoles may have been so lavishly treated. Here I am once again stating a personal preference and it should not stop you from going for this look if you desire it.

Figure 19 shows the re-assembled radio. I think it looks a tad better than when I started. Putting a cabinet back together is a lengthy subject in it's own right since there are a lot of details that effect the final appearance of the radio. Especially if the grill cloth needs to be replaced. There is also cleaning and replacing the escutcheon and dial cover. Cleaning the knobs (of which I believe there are two that are incorrect on my Fairbanks-Morse). Also dealing with the cabinet feet and frequently having to find additional chassis screws. These items are beyond the scope of this article.

As the old saying goes, there is more than one way to skin a cat. I have just gone through the process I follow to refinish a radio cabinet. But I know there are other opinions out there on many of these steps, and I'm always on the look out for other tricks and ideas. If any of you have good ones, please write them up send them in to the Radio Age editors, or you can e-mail me at cx30a@aol.com. Reference these articles. If I get enough we will write them up in a follow up blurb. Be sure to include your name so credit can be given. In the meantime, go out and return a junky radio to former glory.

Figure 19: Refinished radio.