

# Restoring a Classic Philco Cathedral

IN THE LAST COLUMN, WE CONCLUDED A DISCUSSION OF THE IMPACT, ON RADIO SET DESIGN, OF THE GREAT DEPRESSION OF THE 1930S. WITH THE ADVENT OF SUPER-EFFICIENT PENTODE TUBES AND THE INCREASE IN THE NUMBER AND SIZE OF

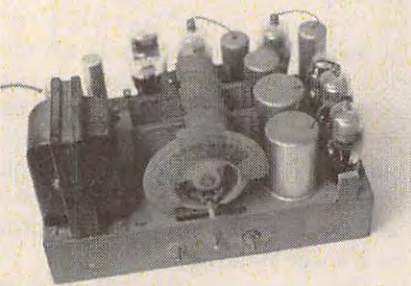
broadcast stations, it was now possible to market a very minimal radio (with as few as three tubes plus rectifier) that would deliver very satisfactory performance—at least on local stations—without an outside antenna. Many new manufacturers sprang up to market these “el cheapo” sets to the cash-starved, but entertainment-hungry, populace.

As discussed in an earlier column, Philco had a different notion of depression marketing. Their response was to produce a line of sets that, though less expensive than established models, were far from minimal. They were essentially full-featured console radios in table-model cabinets. In fact, many models were optionally available in console cabinets for those with the cash and the inclination.

The marketing concept was remarkably successful and Philco turned out the new table models by the hundreds of thousands. Because of their rounded tops and the fact that their speaker grilles are reminiscent of stained glass windows, collectors call sets of this style (by Philco and others) “cathedrals.” Arguably the most popular of the Philco cathedral models among collectors today are the Model 90; its somewhat smaller, but visually almost identical, Model 70; and the somewhat less well known Model 21. With cabinets by master industrial designer Edward L. Combs, these radios are true classics.

Though a Combs cathedral can be

pricy, it is an item well worth pursuing. In fact, I'd say that no representative collection of American broadcast sets would be complete without one! I've been saving a Model 70 for some time to restore for the column, and it looks like the time has come!



THE PHILCO 70 AS RECEIVED. For better visibility, the hooded tube shield has been removed from group of three tubes at right edge of chassis.

## A Project Worthy of Frankenstein

My model 70 chassis came to me several years ago through the courtesy of a reader whose name unfortunately I no longer have. The set was cluttering up his basement and he wanted to find it a new home. Needless to say, I was very quick to take him up on his kind offer!

Now I had a chassis, but I needed a cabinet. Eventually my search led me to Norman Sandbach of the New Jersey Antique Radio Club. He was a Philco

collector and had an extra 70 cabinet to sell me. Since we were both going to attend the Antique Wireless Association Annual Conference (Rochester, NY) that year, he offered to bring it along.

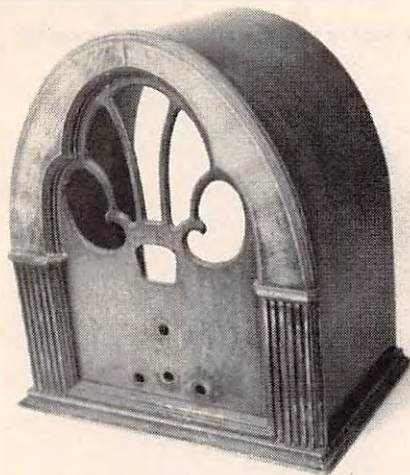
Norm's cabinet looked pretty decent, but it was missing the rear arch support. I understand this is a common problem in Philco cathedrals; the glue dries out, I suppose, and the piece falls out. The cabinet also needed a dial bezel. Thinking ahead, Norm had brought along another model 70 with an intact support, and we made a tracing for my use in cutting out a replacement piece. He also introduced me to a few other members of the NJARC who provided additional help with the project.

I believe it was Tony Flanagan (since a silent key), president of the club, who provided me with the missing dial bezel. He stripped it right off a Model 70 console cabinet that he had on his truck! I also met Joe Milano, who showed me some of the amazing refinishing work he had done on Philco cabinets. Joe was patient enough to explain his techniques slowly so I could take some good notes.

I still remember with pleasure Norm's whirlwind introductions to the various NJARC guys and the generosity and good fellowship with which they shared their parts and expertise! Now the time has finally come to put all of this together and, hopefully, come up with a complete, attractive and nicely-operating Model 70. I do feel a little bit like Baron Frankenstein, though, as I contemplate assembling a finished unit using the parts of so many deceased sets!

## Taking Stock of the 70 Chassis

My Model 70 chassis is quite possibly the cleanest set I have ever worked on. Though it has a light coating of dust



HERE'S THE CABINET I was fortunate enough to purchase from Norm Sandbach of the New Jersey Antique Radio Club. The missing rear arch support is now on order.

(probably from its long stay in my own basement), there is a total absence of that gummy dirt that so often must be cleaned from tubes and other components as the first step in a restoration. There is hardly a trace of corrosion above or below the chassis, and the anodized finish is completely intact, except for an area around the base of the power transformer where some material had apparently oozed out at one time.

This material can be scraped off with a fingernail, but unfortunately it seems to take the finish with it, showing the bare steel beneath. It may be that the transformer did overheat at one time and lose some wax or other compound. I noted that the original electrolytic caps had been replaced, and it may be that the originals had shorted and caused this problem.

Studying the underside of the chassis carefully, I could find no other sign of overheating or other destructive problems. The paint on all of the charming old-style "body-end-dot" coded resistors was still bright, and I saw no signs of arcing or smoke. There are a few rubber-covered wires with brittle and cracked insulation, and these will have to be replaced, of course.

As many of you know, all of the paper capacitors in Philcos of this vintage are potted inside bakelite blocks, with their leads internally connected to solder lugs that are used to make connections to the rest of the circuitry. Comparing my chassis with the pictorial diagram of the set in the *Rider's Manual*, I noted that all six of the original blocks are still

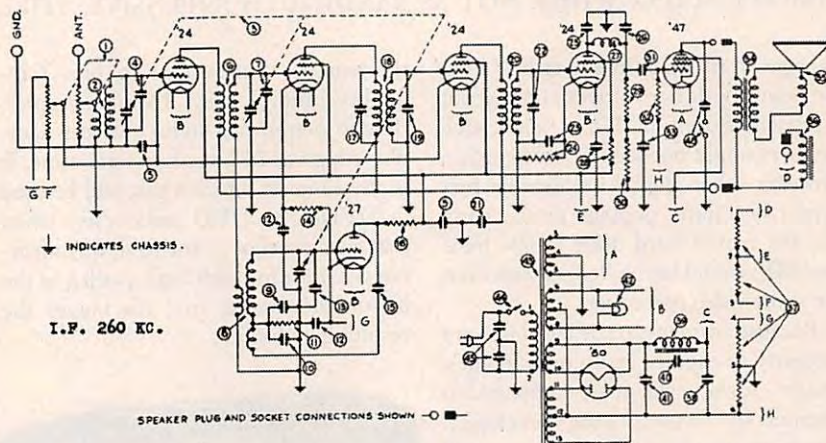
installed, though one was bridged with a couple of external paper caps—perhaps to replace open-circuited ones inside.

A comparison with *Rider's* also revealed that my set, being the earlier of the two Model 70 variations, lacks AVC, and it controls volume at the front end of the receiver rather than in the conventional manner at the detector stage. The tube lineup of this set is: RF amplifier, mixer, IF amplifier, detector—all type 24; local oscillator—type 27; audio output—type 47; rectifier—type 80. See my final **Popular Electronics** column (May, 1999) for a more complete discussion of the Model 70 and Model 90 variations.

Next, as I usually do in the early stages of examining a new radio, I pulled the rectifier tube (the usual type 80), plugged in the set, and turned it on. With the rectifier tube out, of course,

Bintliff's comprehensive book *The Radio Collector's Guide to Philco Bakelite Block Condensers*, which showed the block wiring hookups as well as the values of the caps (and, in one case, a resistor) installed within. Ray's excellent source is still in print and available from most dealers who stock books for radio collectors.

At first, the original values of the electrolytic caps in the power supply were a mystery because the *Rider's* schematic offered only parts numbers. However, the mystery was solved soon after I logged onto my friend Chuck Schwark's web page (<http://members.aol.com/caschwark/index.htm>). In his very well organized "Philco Repair Bench" section, Chuck has assembled an impressive amount of information for Philco restorers. One section untangles the parts numbers, and I shortly discov-



THE 70's CIRCUIT is a conventional superheterodyne with type 24s as RF amplifier, mixer, IF amplifier and detector; a type 27 oscillator; and a type 47 power amplifier. This version does not have AVC.

the set would receive no high voltage, which could wreak havoc in case of a (very likely) capacitor failure. All tube filaments glowed with normal brightness and a meter placed across the plate pins of the "80" socket showed proper high voltage. This was a relief, considering the signs already noted of an overheated power transformer.

### Parts "Want List"

With the preliminary exam over, I began to itemize the parts and services I knew I'd need for the restoration. I planned to completely recap the set, of course, and that meant looking up each of the bakelite-block condensers to see what parts were inside. *Rider's* yielded the part number of each of the blocks in my set. From there I referred to Ray

ered that the original "4916" capacitors had been rated at 6 mF at 450 volts.

If I hadn't already had the Bintliff book in my possession, Chuck's site would have also yielded the information I needed about the contents of the bakelite blocks. Browsing further, I also found a graph of serial number distributions by year originally worked out by Ron Ramirez, author of the popular book *Philco Radio 1928-1942* (ISBN: 0-88740-547-9). Using it, I discovered that my chassis (#656665) had been manufactured between September and October of 1931.

Elsewhere on the site, I discovered Dick Oliver of Elkhart, IN (219-522-4516), who supplies replacement rear arches for Philco sets (\$20.00 plus \$3.00

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shipping). With that information in hand, my plans for making my own arch using the tracing from Norm's set quickly evaporated! (Yes, I have a definite lazy streak—maybe “aversion” would be a better word—when it comes to wood-working or refinishing projects!)

As this column goes to press, I'll also be ordering the required parts so that I'll have the opportunity to carry the Philco 70 project far enough along to have a progress report next time.

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