



Antique Radio

By Marc Ellis

THE SHUTTER-DIAL SET PLAYS

If you've been a regular reader of this column, you know that the last four issues of *Ellis on Antique Radio* have been devoted to the ongoing restoration of one of Zenith's more interesting receivers—a Model 7S232 "shutter dial" set. For those who have just joined us, the "shutter dial" is an ingenious mechanism for displaying only the frequency calibrations in use on a multi-band set.

Zenith installed the mechanism in many of its broadcast/shortwave models beginning in the late 1930's. On that type of dial, the calibrations for individual bands were printed on sets of movable semicircular shutters that were linked to the band-change switch. The shutters moved with the switch in such a way that only the calibration for the selected band was visible behind a strategically-placed window in the dial.

By the close of last month's column, most of the mechanical problems had been solved. The damaged shutter-dial assembly had been repaired (though not yet re-installed on the set); a replacement for the missing dial belt had been fashioned from dial cord; and the set had been given a badly-needed deep cleaning. But, I still had to find a dial glass, as well as a set of knobs for the volume, tone, and band controls.

From a purely electronic point of view, I'd found very little wrong with the set. There was some squealing and distortion when I first tried it out, but that disappeared after I deep-cleaned the chassis and resealed the tube shields (both of which were loose) so that they were properly grounded.

However, I wasn't quite satisfied with the radio's performance. It picked up signals on all three bands, but lacked "pep." The tuning eye's response was



Close-up taken just before installation of the dial glass shows the action of the shutters. The broadcast-band shutter set is being swung out of the way to reveal short-wave band calibrations.

very sluggish on the broadcast band and non-existent on shortwave.

The problem didn't seem to be in the tubes; everyone of them had given a good account of itself in my very unforgiving retired military tester. My hunch was that a realignment would do the trick. But first, as a measure of the radio's general condition, I decid-

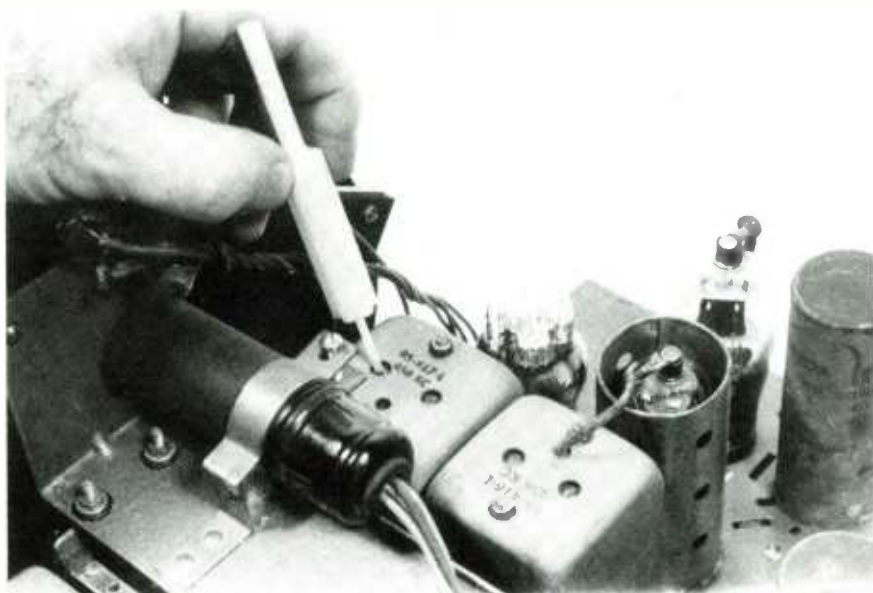
ed to check all of the voltages at the tube sockets.

Interpreting the Readings. In comparing the measured voltages with the ones published by the manufacturer, I found two discrepancies that I felt warranted investigation. First, the plate and screen voltages throughout the set tested more than 15% below the manufacturer's specifications. Second, the no-signal grid-bias voltages on the first-detector and amplifier tubes were reading about -0.5 volt instead of the published -2 volts.

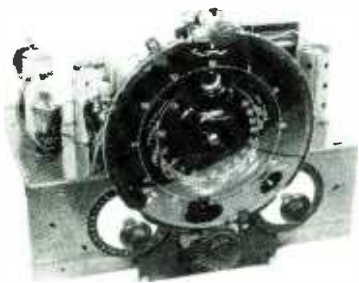
The most-obvious possible causes of consistently low plate/screen measurements are a weak rectifier tube and leaky filter capacitor(s). The first two possibilities were quickly ruled out through a line-voltage check and my previous results with the tube tester. As for the filter capacitors, I had already spot-checked them for leakage and found no problems.

In addition, the set was running with no trace of hum; another good sign. But just to make sure, I monitored the plate voltage, while bridging each of the filter capacitors, in turn, with a known good unit. There were no significant changes. So I concluded that the plate/screen voltage discrepancies were not important and decided to ignore them.

The discrepancy in grid-bias voltage however, seemed a little more serious, since it amounted to a four-hundred percent difference. Suspecting trouble in the automatic volume-



Tweaking the IF transformer trimmers helped a lot in restoring the set's sensitivity and "pep."



Completely restored chassis waiting for installation in cabinet.

control circuit, which controls the bias to the two tubes in question, I checked it out very thoroughly. But, once again, I was unable to find anything wrong.

After puzzling over the problem for quite some time, it suddenly exploded in my mind that the published value of minus two volts had to be a mistake. With that much negative voltage on the control grids of the tubes in question, the "eye" tuning indicator (which is tied into the same circuit) would have to be fully, or nearly, closed. Such an indication would obviously be incorrect for the "no signal" condition specified.

To confirm my growing suspicion that the published grid bias voltages were incorrect, I decided to check my Rider's manuals for Zenith sets with similar circuitry. I soon found a couple and, sure enough, the published voltages for the equivalent circuit points were very close to what I had measured on my own set. So once again I decided that the "discrepancy" was meaningless and could be ignored.

Troubleshooting of this kind is particularly frustrating. It would obviously be a whole lot easier to deal with a set that didn't work at all. In such cases, you can usually trace the problem to some failed component, replace it, and congratulate yourself on a job well done. But when faced with more ambiguous "problems," such as the ones I had, the trick is to realize when you are trying to fix something that "ain't broke" and to stop before expending vast amounts of time and energy. It isn't always an easy decision to make!

Realigning the IF, RF, and oscillator circuits per the manufacturer's published instructions finally brought the set back to life. Reception is now quite satisfactory on all bands, and the tuning indicator's response is very lively on both the broadcast and the shortwave bands.

Scrounging For Parts. The problem of the missing knobs was solved without much effort on my part. Soon after the original column in this series hit the streets, I received a post card from reader John Cram (Troy, Ohio), who graciously offered a set of original Zenith wood knobs.

When they came, they turned out to be a very close match to my missing and broken ones—Zenith logo and all! They look great on the set, John. Thanks a million!

The replacement dial glass was ob-



This close-up of the cabinet top shows the ravages of a furnace explosion. By next month, I hope to have cabinet looking beautiful again.

tained, indirectly, through a want ad that I placed in *Antique Radio Classified Magazine*. At the time, I was looking for both the glass and the dial belt. Three of the items were carried by *Antique Electronic Supply* of Tempe, Arizona. One of my own readers (Mark Cochenour, Beaver Falls, PA) sent me the same information and enclosed photo copies of the catalog pages, to boot.

I have to admit some embarrassment over that, since *Antique Electronic Supply* is a well-known firm (see *Suppliers of the Month*, below) and an advertiser in this publication. In any case, I immediately made a call to Arizona and found that the A.E.S. people had also been following the restoration and were about to contact me! Thanks to the magic of VisaCard, the dial glass was shipped to me via UPS the same day—along with a 6F5G tube I needed to complete my program of substituting original G-type (tall glass) tubes for the three "GT" (short glass) replacements that had been made in the set over the years.

The dial glass slipped into the old mountings perfectly, and was the last piece I needed to complete my restoration of the set. It's now ready for re-installation in the cabinet. I wish the cabinet were also ready for the re-

installation. But, as you can see from the photos, it's definitely not!

If you've been following this series from the beginning, you know that the shutter-dial set was the victim of a minor furnace explosion—which is why the last owner was willing to part with it. That's the reason for the charred speaker grille and the rather distressed condition of the finish.

Let me get something off my chest right now, fellow antique-radio lovers. I hate cabinet refinishing! I can happily spend hours trying to track down a subtle malfunction in a radio circuit, but the fussy detail work involved in creating an acceptable furniture finish really drives me nuts.

However, once having gone through the trouble of restoring an interesting and unusual radio chassis, I obviously can't neglect the cabinet. Next month, I'll let you know how I made out.



Here is another mysterious Philco device (see text). Write me if you can identify this thingumajig.

Suppliers of The Month. Last month, we gave some space to *International Components Corp.*—dealers in receiving and industrial tubes. As I encounter other suppliers of interest to antique radio hobbyists, I'd like to continue the practice. So if you sell services or parts our readers would like to know about, send me a catalog and/or letter and I'll work you in as space permits. Here's this month's installment.

Antique Electronic Supply is operated by the father-son team of George H. and George A. Fathauer. George A. (the son) writes that he was an antique-radio restorer and collector who "turned pro" in 1982 when he and his dad bought a collection of 40,000 early vacuum tubes and 300 radios. The two Georges used the collection to start a brand-new radio sales, radio repair, and mail-order parts business.

(Continued on page 106)

ANTIQUÉ RADIO

(Continued from page 89)

As the catalog business grew, the radio repair and sales business was dropped—and today the Fathauers concentrate their efforts solely on locating and producing parts for those interested in radio restoration. They now employ seven people and operate out of a 4500 square foot office/warehouse facility.

The 1988 catalog that A.E.S. enclosed with my order has a beautiful color picture of an Atwater Kent breadboard set on the cover. And the 23 attractively-laid-out pages inside are filled with items targeted to appeal to antique-radio restorers and enthusiasts. The catalog lists over 1600 tube types, as well as parts such as transformers, chokes, coils, resistors, capacitors, tube sockets and just about any other component you could think of.

Certain key parts of wide interest to restorers, but unavailable through normal channels, are available through that company as reproductions—including power transformers with 2.5-volt heater windings; dial belts; Zenith dial glasses and pointers; Philco dial scales and push buttons; grille cloth; and other items too numerous to mention. Write or call A.E.S. for a copy of their useful and interesting catalog (688 W. First St., Tempe, AZ 85281; Tel. 602/894-9503). There is a minimum order for mail sales, which is \$10.00.

Prior to finding my Zenith dial glass at A.E.S., I was beating the bushes for clock-parts suppliers who might have crystals that would fit. In this day of disposable battery clocks, such suppliers aren't exactly common. But one that I did locate suggested that I try a mail-order firm called *Timesavers* (Box 469, Algonquin, IL 60102; phone (312) 658-2266). *Timesavers* charges \$2.00 for their catalog, but it's a browser's delight. In my opinion, it is well worth the money even if you don't buy a thing.

If you need an oddball-size dial glass however, you certainly ought to be able to find it here. About 90 different sizes of convex glasses, ranging from 2 to 8-1/2 inches (my Zenith size) in diameter, are listed. And over most of that range, sizes are available in 1/16-inch increments. In addition to an incredible array of modern and archaic clock parts, the 80-page (profusely illustrated) catalog shows many items

that should be of interest, including precision and special-purpose tools, polishes, and lubricants. Minimum order is \$15.00.

Recently, I received an updated flyer from Don Diers (4276 North 50th St., Milwaukee, WI 53216-1313). Don is a **Hands-on Electronics/Popular Electronics** reader who was stimulated to enter the electronics-surplus business by reading this column. The four-page flier lists a wide array of tube types and interesting "odd-lot" items, many of them antique. Don's chatty, personal catalog descriptions are fun to read. Send him an S.A.S.E. to get a copy for yourself.

Another Philco Mystery. Last month, we mentioned some pictures of Larry Lovell's mysterious Philco gadget and asked reader's opinions about what it might be. That issue hasn't been published yet, so I don't have any comments to report. However, I thought it might be fun to follow up on Larry's Philco mystery with an interesting one of my own (my mystery item is shown in a photo that appears on page 89.)

The small, highly-chromed device bears a prominent Philco logo and looks to all the world like a miniature speaker for an antique radio. (I've included a pencil in the photo for size reference.) A piece of ordinary rubber zip-cord comes through a grommet on the back panel, which also bears a slide switch labeled ON and OFF. Inside the mystery device is what appears to be an ordinary permanent magnet (PM) speaker heavily damped with a filler that looks like some form of cotton or glass wool.

I spotted this device under a table at a swap meet a couple of years ago, and wondered what it was for quite a while—was it an extension speaker?... tweeter?... display item?, etc.

However, I now know what it really is (none of the above). Here's a hint: I discovered the answer by accident while I was thumbing through the Philco section of Morgan McMahon's popular book, *A Flick of the Switch*. I'm going to let you have the fun of discovering it, too. But even with that hint, you're going to need sharp eyes! Those who figure out the answer, or even send me a good, creative guess, will receive full recognition in the column. Write to Marc Ellis, **Popular Electronics**, 500-B Bi-County Blvd., Farmingdale, NY 11735. ■