The Radio Collector™

September, 1994

Collecting Radio Peripherals

Part 3 - Books and Periodicals

Last month, we concluded our coverage of third-party service literature -- that is, collections of service information, covering specific radios, published by sources other than the manufacturer. After you have been active in the hobby long enough to develop preferences for particular makes, you may also become interested in collecting manufacturer-provided service information. A discussion of such material is beyond our scope, but good examples are the yearly service notes that were published by RCA and Philco.

Vintage periodicals help us understand both the early equipment itself and the context in which it was used.

Radio Servicing Books

There are many books originally published for the radio service trade that are just as useful to today's rehabbers and restorers. And in addition to their value as source materials, they are collectibles in their own right. This is a very large playing field, as anyone knows who is following Paul Bourbin's *Vintage Book Reviews* series in this publication. However, I think it's worth mentioning a few of the most obvious classics and some of my own personal favorites. Forgive me if I happen to leave out some of yours!

Keep an eye open for the McGraw-Hill radio servicing books published during the 1920's, 1930's and 1940's. They're easily recognizable by their drab-green bindings and gold lettering. A series written by Moyer and Wostrel (which includes *Practical Radio, Radio Construction and Repairing, and Radio Receiving Tubes*) is very helpful in understanding the technology of the 1920's. Another Mcgraw-Hill book, *Principles and Practice of Radio Servicing* (editions published in 1939 and 1943), offers insights into radios of a later period.

Alfred A. Ghirardi wrote two 1930's classics that belong in every collector's library. *Modern Radio Servicing* (Murray Hill Books) is a treasure-trove of practical troubleshooting information. A more theoretical approach to radio is provided by *Radio Physics Course* (Radio Technical Publishing Co.).

First published in the late 1930's was Ghirardi's *Radio Troubleshooter's Handbook*. Billed as the companion book to *Modern Radio Servicing*, it is loaded with case histories of actual problems in specific radio receivers and also contains much useful appendix material.

Another sought-after service publication of the era is *Official Radio Service Handbook* by J.T. Bernsley (Gernsback Publications, 1936). This is a little like Ghirardi's *Modern Radio Servicing* and *Radio Troubleshooter's Handbook* rolled into one. It contains practical radio servicing techniques, case histories of actual repair problems with specific receivers and a variety of useful reference material.

During the last couple of months, we spent quite a bit of time on John Rider's massive, multi-volume, *Perpetual Trouble Shooter's Manual*. But this prolific author also wrote and published many short, highly-focused books on specific aspects of servicing. These include the 1930's releases *Servicing Superheterodynes, Practical Testing Systems, The Oscillator at Work*, and various titles in the *An Hour a Day With Rider* series.

For help in understanding 1940's and 1950's technology, I often find myself referring to the work of another widely-published radio writer, William Marcus. Useful books you might come across are *Practical Radio Servicing* and *Profitable Radio Troubleshooting* (both written in collaboration with Alex Levy and published by McGraw-Hill--which, by this time. had abandoned the drab-green binding for a spiffier two-tone blue one) and the more theoretical *Elements of Radio* (written with Abraham Marcus as a War Department training course and published by Prentice-Hall).

Texts and "Hobby" Books

Though we've certainly hit some of the high spots, we've hardly done justice to the wealth of radio service material waiting out there for you to discover. And there are other areas which we can't even begin to cover. These include books on radio theory primarily written for engineers (by such authors as Terman and Henney) as well as the vast range of volumes written over the years for radio hobbyists. A few of the former should be in every serious library as a reference source for theoretical questions. As to

The Radio Collector™
Volume 1, Number 9

The Radio Collector is published monthly by Marc F. Ellis. Editorial content copyright 1994 by Marc F. Ellis, except as noted. The Publisher is not responsible for transactions resulting from advertising published herein or for any applications of editorial content. Subscription and advertising rates, as well as magazine format, may be revised at any time.

How to Subscribe:
Annual subscription rates are as follows: via surface mail $20.00 (U.S.), $21.50 (Canada--U.S.funds); via air to other countries, $35.00 (U.S. Funds). Make out checks or money orders to *The Radio Collector* and mail to our post office box (see "How to Reach Us" below).

Back issues, when available, are $2.50 each, postpaid.

Classified Advertising
Subscribers may place classified ads in *The Radio Collector* at no cost. See classified section for instructions and limitations.

Display Advertising
Rates and size requirements for display advertising are posted elsewhere in this issue.

Contributions
The Radio Collector welcomes the submission of articles, tips, and/or photos covering any phase of radio collecting. We are particularly interested in contributions that will assist those who are just entering our hobby. Submissions will be printed at our discretion and may be edited. Unless special arrangements are made, submissions will not be returned and, if printed, become the property of this publication.

How to Reach Us
To order a subscription, or place an advertisement, write ***The Radio Collector*, P.O. Box 1306, Evanston, IL 60204-1306.** Please include full payment for financial transactions, including any fee for extra words. Classified ads should be submitted on a separate sheet from other correspondence. We can be reached by phone at (708) 869-5016 (answering machine picks up after 4th ring).

the latter, pick up as many as you can! They are invaluable in conveying a feeling for the exuberance and romance surrounding the radio hobby in the twenties, thirties and forties. And many provide construction details for receivers and other equipment that would be as much fun to build today as they were decades ago.

A few of my favorites, all of which turn up fairly regularly at radio meets and/or are available in reprint form: *Radio for Everybody* by Austin C. Lescarboura (Scientific American Publishing Company, 1923, 1923), Great review of 1920's radio theory and practice; some construction details on simple sets. *Gernsback's Educational Library* (Radio Publications, New York, NY, 1938),. a set of ten pamphlets for radio beginners that you can spot by their small size (about 5" by 6") and comic-book style covers. These provide interesting orientation material for new hobbyists, including a smattering of theory, simple radio experiments, practical antenna designs, and construction details for allwave receivers.

Finally, a favorite from my own boyhood, *Radio For the Millions* (Popular Science Publishing company, 1943). This volume is crammed with lavishly-illustrated servicing tips, as well as construction details on a variety of receivers from the simple to the exotic. The high percentage of eccentrically-packaged projects (including radios built into bookends, flour canisters and lamps, a "letter radio" that can be mailed and a "twin-bed" radio that can be tuned from either side.) makes this volume a browser's delight.

Many of the classic radio books are still widely available. Even a small collection will provide valuable information and enhance your enjoyment of our hobby.

Periodicals and Other Material

Almost everyone enjoys reading vintage trade and hobby periodicals. The advertising in these publications is as interesting as the editorial material. Together they are invaluable in helping us understand the equipment of their eras and the context in which it was used. Once again, we can hardly begin to name all of the ones you might come across. But among the best known are *The Electrical Experimenter* (pre-broadcast era radio), and the later *Radio News, Radio Craft* and *Short-Wave Craft*.

Be sure not to neglect the broader-based hobby magazines of the *Popular Science* variety, or the periodicals designed for general readership (especially those aimed at middle-class and carriage-trade audiences). Magazines in the latter categories, such as *The National Geographic* and *Saturday Evening Post*, frequently carried detailed ads, usually larger and more colorful than those in the hobby and trade mags, featuring radios and other luxury items.

It's ironic, by the way, that bound volumes of the *Geographic* found in libraries often have had most, or all, of the ads removed. Presumably because such material was of only ephemeral value. So the historian who goes that route to find vintage product illustrations is apt to be disappointed.

There are many other categories of radio-related print material that we can only mention here. They include promotional materials (aimed at both the professional and consumer trade), packaging, catalogues and instruction manuals. I'd suggest keeping your eyes peeled for print and paper items whenever you browse through book stores or attend swap meets. Even if you don't have a major commitment to collecting in this area, you're sure to come across many items that will provide valuable reference material or enhance your enjoyment of our hobby. You will also be rescuing these items from the possibility of being mishandled or trashed by less-knowledgeable people, thus saving them for the use and enjoyment by future generations of historians and hobbyists.

Marc F. Ellis

COMMENTS FROM THE EDITOR

AWA Rochester Conference

This issue comes to you a bit late because, during the week or so I would normally have been occupied with putting it together, I was pleasantly involved in preparing for, driving to and from, and attending the 1994 Antique Wireless Association conference in Rochester, NY.

It seems that, with every meet I attend, I'm tied more and more to the *Radio Collector* exhibit table and have less and less time to enjoy the flea market, exhibits and seminars. And this year's AWA conference (which hosted an estimated 1000 registered and walk-in participants) had so much to offer that I was able to sample only a tiny percentage of it.

I did attend a few of the talks related to the Conference's World War II theme: notably Bart Lee's fascinating discussion of clandestine communications equipment, Gary Yoggy's no less interesting coverage of armed forces entertainment and propaganda broadcasts, and Lud Sibley's very smooth and informative slide presen-

(continued on p. 6)

PLAY IT AGAIN!

A No-Nonsense Course in Radio History, Evolution and Repair

BASIC TOOLS AND INSTRUMENTS

Last month, we concluded the discussion on vacuum tubes with some suggestions about tube testers. Now let's go on to talk about some other items you should plan on having at your workbench.

Tools

As far as tools are concerned, you will need the usual assortment of wire cutters, screwdrivers and needle-nose pliers. A set of small socket wrenches in sizes from ¼" to ½" is almost essential. You will also need a good soldering iron.

Antique radios were assembled with 100 watt irons. The wiring is heavy and most ground connections are soldered directly to the chassis. The solder was high-melting, more like plumber's solder than what we use today. Small, pencil-tip irons are useless for antique radios. Get an iron of at least 40-45 watts rating with a large pyramid tip. It will handle most of the component connections. I use a 100 watt tinsmith's iron for chassis connections.

The tip of your iron must be "tinned" by melting a coating of solder onto it. Scrub stubborn spots with steel wool until they accept a solder coating. A poorly tinned tip doesn't transmit heat well and makes your job more difficult. Periodically wipe the hot tip on a damp sponge to keep it clean and bright.

The Volt-Ohm-Milliammeter

You *must* have a test meter to work on radios. There are 3 types: the volt-ohm-milliammeter (VOM), the vacuum tube voltmeter (VTVM) and the digital voltmeter (DVM). When your antique radio was made, the VOM was what servicemen used. The VTVM was a laboratory instrument and the DVM didn't exist. The VOM will tell you almost everything you need to know about your set.

The basic meter movement in a VOM is a milli- or microammeter. Let's assume that the basic movement is 0-1 milliamperes, full-scale, and we put a resistor in series with it such that the resistor plus the internal resistance of the movement equals 1000 ohms. By Ohm's Law, 1 volt will cause 1 milliampere to flow and register full scale. We now have a voltmeter reading 0-1V.

If the resistance combination were to equal 10,000 ohms, the meter would read 0-10V, 100,000 ohms will read 0-100V, etc. We say that such a meter has a basic sensitivity of 1000 ohms per volt. If the basic meter movement were 100 microamperes, the sensitivity would be 10,000 ohms per volt; if 50 microamperes, 20,000 ohms per volt.

The meter measures ohms by applying a voltage to the unknown resistor from an internal battery and displaying the current through the resistor as ohms on a special non-linear scale. Although the VOM will measure current, there is little use for this feature. Current measurements are rarely needed in radio servicing. A 20,000 ohms per volt VOM is excellent for radio work, and can be bought at Radio Shack among other places.

Be careful with your meter; it is easily damaged. Meters are most often damaged by applying voltage to them while they are set for current or resistance measurement, or by applying a voltage or current higher than the selected range. Be sure the selector switch is set correctly for what you are measuring and the range switch is set for a value higher than you expect to find. Never try to measure resistance in an energized circuit with any kind of meter. The VOM works on current which must come from the circuit being measured. Most radio circuits have high resistances in them so the meter current will cause a voltage drop. This means that the voltage you read on the meter is less than the actual voltage because the act of measuring the voltage changes it. The higher the ohms per volt rating of your meter, the less the change.

The VTVM and DVM

In the VTVM a tube and a meter movement are connected in a bridge circuit which is balanced with the zero adjustment so that no current flows through the meter when there is no voltage on the tube grid. A test voltage applied to the grid unbalances the bridge to give a reading. Modern equivalents of the VTVM using FET's are available at Radio Shack. The VTVM has an input resistance of 11 megohms on all ranges, so it draws virtually no current from the circuit under test and grid voltages can be reliably measured. The VTVM can measure very high resistance values, but it can't measure current. Since you need current measurement so rarely, that lack is unimportant. I use a VTVM for most of my work and recommend it to you.

The DVM has some impressive features, but is probably the least useful meter for radio servicing. Alignment of a radio requires tuning its circuits for peak output. The sample and display cycles of the DVM cause dead intervals in the readings making peaks hard to see. Peaking is simple with an analog meter.

Safety Note! Whatever kind of meter you get, spend some money on a good, well-insulated set of test prods. You will be measuring some high voltages. Keep your prods in good condition and get new ones when they show signs of deterioration.

Abbreviations for Electrical Units

In the 1920's and 30's there was little consistency in the abbreviations for units. You will be looking at old literature and diagrams with a good chance of getting confused. Today the abbreviation for the unit is capitalized because units are named for people. Thus the old mv and ma are now mV and mA. Note that in the old days, capital "M" meant 1000 (today we use "K"). For a more complete comparison of old and new units, see the chart at the bottom of this page.

Next time we will discuss sources of parts for your antique radios.

Conducted by Ken Owens
478 Sycamore Dr.
Circleville, OH 45113

COMPARISON OF OLD AND NEW UNIT ABBREVIATIONS

OLD	NEW
mf, mfd (microfarads)	μF (same)
mmf, μμf (micromicrofarads)	pF (picofarads)
M (1000 when used for resistance)	k, kΩ, K, KΩ (same)
meg. (megohms when used for resistance)	M, MΩ (same)
cps (cycles per second)	Hz (Hertz)
mc, kc (megacycles, kilocycles)	MHz, kHz or KHz

A Pre-Power Workup For That Flea-Market Radio

Here's one man's procedure for ensuring the best possible results when it's finally time for a smoke test!

By Steve Kalista, Sr.

1. Don't be tempted to try the set out until you've completed these steps!

2. Replace the line cord, even if it looks ok. One exception: a.c.-d.c. sets with a line-cord resistance (cord has three wires in it). This type of cord is difficult to get, and shouldn't be removed unless it tests bad (see Step 16).

3. If your set has a power transformer, protect this difficult-to-replace component with a fuse (one ampere) installed in series with one of the line cord leads. Use an in-line fuse holder mounted under the chassis in some convenient manner.

4. Check all tubes; it's ok to use a simple emission-type checker at this stage. Later, more critical, testing (to be discussed) should be done with a transconductance type tester. Don't worry about "weak" tubes now, but obtain replacements for all dead, shorted or missing tubes.

5. Remove dust, dirt, cobwebs, etc. using a vacuum cleaner and soft brush followed up with a damp cloth. Pay special attention to dust trapped between the plates of the variable capacitor. You may need to use the blower attachment of your vacuum cleaner, or even a jet of compressed air, to get the dust out from between the plates.

6. Give the set a thorough visual inspection for damaged or missing parts. Note any charred resistors or other components, and check the integrity of hookup wire insulation. Rubber insulation usually becomes brittle with age and tends to flake off the wire when moved even slightly.

7. Replace all hookup wire with questionable insulation. Replace all charred resistors (you'll have to obtain the value of these resistors from the set's schematic if the components are so badly discolored that their color codes can't be read).

8. Charred resistors generally mean that one or more paper bypass capacitors have shorted somewhere in the set. I'd suggest replacing <u>all</u> paper capacitors with new ones of good quality rather than trying to locate the shorted units. Actually, it's a good idea to replace all the paper capacitors whether or not there are signs of component failure. Be sure the working voltage (WV) of the replacements is equal to, or greater than, that of the originals.

9. Replace *all* electrolytic capacitors (the ones with "+" and "-" polarity markings). This is a must. Be sure to observe the same polarity when wiring in the replacements or the new capacitor will short out and self-destruct. Modern electrolytics tend to come in higher capacitance values than the ones found in older radios. Replace with equal value if you can, but don't hesitate to use the closest *larger* size you can buy. Same with the capacitor's working voltage (WV) rating.

10. Above-chassis, can-type capacitors are disconnected, but left in place for looks. Replace them with tubular capacitors mounted underneath and wired to the appropriate circuit points (observing proper polarity for electrolytics). If you have difficulty finding a way to support these replacement tubulars, install a terminal strip. Clean and tin a bare spot under the chassis using a 100-watt iron and rosin-core solder, then solder on the terminal strip's mounting lug.

11. Is the speaker missing? It was probably a dynamic unit (the kind having an extra pair of wires leading to a field coil). These are hard to find, but can be replaced with common "PM" (permanent magnet) speakers not having a field coil. Check the plate resistance of the audio output tube in a tube manual, then obtain an output transformer to match. Mount the transformer on the new speaker, connecting the primary to the output tube (see set's schematic) and the secondary to the speaker's voice coil. The speaker field was usually used as a choke in the power supply circuit; check that circuit for the d.c. resistance of the coil, which is usually given. Replace the field with a 10- or 20-watt power resistor of the correct value.

12. Turn the variable capacitor through its range, watching and listening for plates that might be rubbing against each other and shorting. Correct by carefully bending the misaligned plates back into position.

13. Spray tuner/control cleaner (Radio Shack) into all volume and tone-control housings and rotate controls through their complete travel several times.

14. Spray tuner/control cleaner on the contacts of bandswitches and other multi-position rotary switches. Then work the switches through all their positions several times. Silver-plated contacts that have become blackened through oxidation should be should be treated with silver cleaner (use Q-tips) and worked through their positions prior to using the tuner/control cleaner.

15. Insert tubes in their proper sockets.

16. If your set is an a.c.-d.c. model (no power transformer), make one more test. Connect an ohmmeter (X1 or X100 scale) across the two prongs of the power plug. The tube filaments in such sets are wired in series across the line, so you should get a reading on the ohmmeter after turning on the set's power switch. You already know that the tube filaments are good, so if you don't get a reading, the power switch may be bad. Alternatively, a filament dropping resistor (used in earlier a.c.-d.c.'s) may be open. The resistor may take the form of an extra wire built into the line cord, a plug-in unit that looks like a tube or a ceramic power resistor mounted on the chassis. Ballasts and resistance line cords are difficult or impossible to find, and dealing with open ones is beyond the scope of this article, but one way is to substitute a ceramic power resistor having the proper resistance and wattage ratings.

Tune in again next month, when Steve tells us how to fire up a superhet receiver.

Editor's Notes:

Here are some ideas that occurred to me as I read through Steve's procedure. Rather than interspersing them with Steve's narrative, I've printed them below, in the form of notes keyed to the numbered steps in the article. I'm sure I'm speaking for both of us when I say that comments from the readership-at-large are also solicited!

Step 1. As soon as you begin work on the radio, note down the model number and, if you don't have a schematic for it in your file, take steps to order one.

Step 4. As you remove the tubes, it's a good idea to sketch the location of each one. Check the set's schematic to see that all tubes were in their proper sockets. Do not replace the tubes at this time.

Step 6. Check also for signs of missing parts (empty screw holes, "shadow" outlines on the chassis, etc.) and butchered circuitry (crude solder joints, taped dead-end wires, amateurishly installed components). If possible, restore circuitry to its original configuration, using the schematic as your guide.

Steps 7 - 10. When removing old com-

(continued on page 8)

INFORMATION EXCHANGE

This is an open forum for interaction among our readers. Here you can ask questions about some aspect of our hobby, answer a question that's been posed or pass along other information of general interest. Send your questions, answers and information to **The Radio Collector**, P.O. Box 1306, Evanston, IL 60204-1306. Submissions may be edited or paraphrased.

ANSWERS TO QUESTIONS

Dead S-38 Mystery Solved

Regarding Alton Dubois' dead S-38. (1) Check resistance from 35L6 screen to B- with tube in socket and all wiring in place. A short in the tube socket (quite rare) would be evident. (2) Try substituting a known good 35L6. (3) A capacitor may be failing under power. -- Dick Mackiewicz, Coventry, CT.

In reference to Alton Dubois' S-38 problem, I would say replace the 35Z5. It most likely has a high resistance cathode connection internally. With everything disconnected Alton would read volts, as the meter current would be negligible. However, even the screen current of the 35L6 would be sufficient to drop volts to zero. Easy proof: disconnect everything from the Z5 cathode, measure volts, then connect a resistor, say 10k, from the cathode to ground. If volts drop, 99% sure tube is defective, assuming plate feed. Usually the line volts is ok. Or...easiest of all, replace the tube. This happened to me just the other day with a 5Z4, absolutely no output. -- Bob Zinck, Halifax, N.S., Canada

Before someone calls me a dope, I'll do it! I retested the tubes in the S-38 and found that half the filament of the 35Z5 was open. Yet it lit up in the tester and the set. Apparently the remaining portion of the filament could not deliver the current. A new tube corrected the problem. -- Alton A. Dubois, Jr., Queensbury, NY

QUESTIONS AWAITING ANSWERS

Need Microsynchronous Info

Last week I found, in an antique shop, an old leatherette bound booklet. It is entitles "The Victor Dial List." Little Nipper on the cover attracted me because he was my boss for 32 years. The booklet has 35 pages and is 6 1/2 x 3 1/4". It contains station names, locations, frequencies and wattages.

On the cover is an illustration of the front bezel of a radio dial, which has what looks like a sliding control for tuning. The set is identified as a "Victor Microsynchronous Radio." The book is not dated, but one clue to its age is an advertisement for records to be used with the "new" Victor radio and the Electrola RE45.

Can anyone tell me the model number of the microsynchronous radio? And did the dial knob actually slide instead of turning? -- Alton A. Dubois, Jr., Queensbury, NY

Detail from the cover of Alton's book. It's a bit dark, but you should be able to make out the dial arrangement.

Oscillator Quandary

I have a voltohmeter that I was given in 1939, in lieu of a week's pay ($8.00), by a radio man I worked for. It had a test oscillator section next to it in the wood case. The oscillator had a type 32 run by a 1 1/2 volt battery and a 22 1/2 volt battery. The meter has a Triplett #321 movement. There is no name or model number on the instrument.

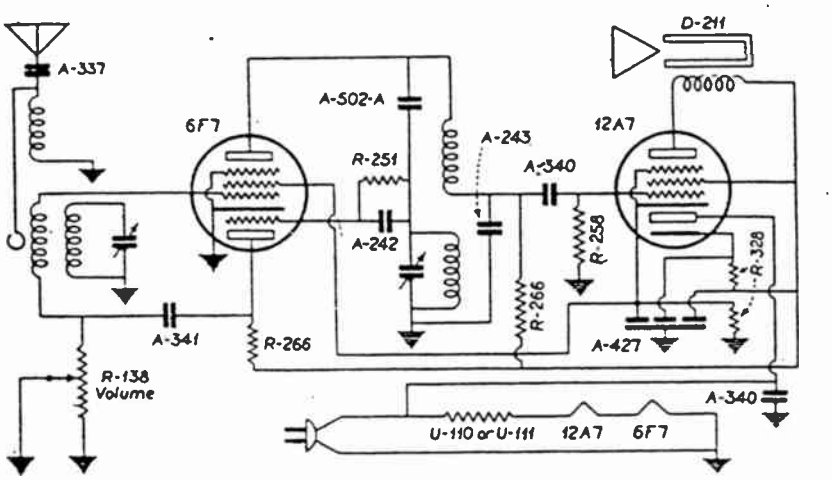
I'd like to find out more about this unit so I can restore it. The oscillator section is long gone, but I have a circuit from the RCA Radiola 20 manual that seems to be similar. Can anyone provide more information? -- Alton A. Dubois, Jr., Queensbury, NY.

GENERAL INFORMATION

What Can You Leave Out Of A Kadette?

I see you got some info regarding mods to the International Kadette power supply over its production run--culminating with the introduction of the 25Z5. Recently a friend sent me some information from Rider's on the ultimate Kadette mod, the Kadette Junior! If you're wondering what more could be left out of this already minimal radio, try half of the tubes!

The set dates from 1934 and makes use of the newly issued 6F7 (combination triode and pentode) and 12A7 (combination rectifier and power pentode). Thanks to the multipurpose tubes and reflexed circuitry, this receiver has 5-stage circuitry and may actually outperform the original Kadette! -- Ray Larson, W. Los Angeles, LA.



Circuit of the Kadette, Jr. Two multipurpose tubes do work of four.

DICK'S CORNER

Tips and Tidbits from the World of Antique Radio Collecting and Restoring

Leatherette Lore

Many old radios were covered with black leatherette, Zenith Trans-Oceanics being probably the best known. Storage for long periods of time in a warm dry climate may have caused the glue holding the leatherette to the case to dry out; storage in a damp basement may have caused the glue to decompose. In either case, you may now be faced with the job of regluing separated areas.

If the problem was dampness, first allow the radio to dry out for several weeks at normal room temperature and humidity. When you are ready to start, your first inclination might be to use contact cement, but I don't advise it. This adhesive is highly flammable, should only be used in well-ventilated areas, and is unforgiving should you misalign the mating surfaces.

My solution is to use ordinary white paper paste. This dries slowly enough to allow smoothing out wrinkles, and any excess may be wiped off with a damp sponge or cloth. Allow a day for the paste to dry thoroughly.

Now you're ready to freshen up the appearance of the leatherette-covered case. First, use masking tape to cover up all surfaces (plastic, cloth, bakelite, etc.) adjoining the leatherette areas. Then apply a coat or two of liquid black shoe polish to the cabinet, using the foam applicator that came with the polish. Allow time for thorough drying, buff the case with a soft cloth, remove the masking tape, and enjoy the newer appearance of your old radio.

Note that masking tape was used to keep the polish off surfaces it was not meant for. This is a good habit to form during any restorative process. The wrong polish can permanently stain wood or leatherette and change the color of plastic or bakelite. Grille cloth is easily stained and decals may be loosened. Take the time to tape, but *not* over decals--which could be pulled up on removal. Instead, tape clear plastic over the decal. And remove the tape as soon as possible, it gets difficult to remove as it ages.

Easy Does it With Panels and Dials!

Silk-screened panels were common on 1920's battery sets, and often included intricate scrollwork in gold. When cleaning such panels, start by careful brushing with a dry Q-tip in an inconspicuous area of the design. If the decoration does not wipe off, switch to a very soft very soft cloth and gently remove all surface dust. Now test again with your Q-tip, this time dampened in warm water. If ok, gently wipe down the entire panel with a soft, damp cloth. Go over a small area at a time and proceed slowly! Stop immediately if some part of the design begins to come off. If that cleaning went well, go over the panel with a MILD solution of liquid dishwasher detergent and WARM water (test with a Q-tip first!). To preserve your panel, you now may apply a coat of liquid car wax containing NO cleaners. (I use Kit). Test in a small corner first!

I have seen all the numbers disappear from celluloid dials (commonly used in the late 1920's through early 1940's) after they were merely wiped with plain cold water! The grease and grime accumulated over many years apparently acts as a solvent for the paint. Before cleaning a dial, carefully test the inside and outside surfaces (in an inconspicuous area) by gently wiping a tiny part of the design with a damp Q-tip. If that works, proceed as previously suggested for silk-screened panels, working your way up to a mild detergent solution. But don't use wax or polish.

Dial glass carrying a design can usually be cleaned safely on the *non* painted side. Lay it on a soft surface, don't allow the glass to move around as you work with it, and don't allow water to seep under the painted side. Now turn the glass over and clean as suggested for dials and panels, testing with a Q-tip as you go. If the detail begins to loosen or flake, you can either leave it alone and hope for the best or try preserving it by CAREFULLY spraying one or two fine coats of Krylon Crystal clear. This also does a good job of protecting dry transfer decals.

Conducted by Dick Mackiewicz

COMMENTS FROM THE EDITOR

(continued from p. 2)

tation on military equipment. Lud's accompanying handout, providing references on equipment sources and documentation, was worth the "price of admission" all by itself.

Though I didn't attend any of the auctions, the R.C. table in the publications display area was right across the hall from the ballroom where they took place. And the frequent bursts of the applause traditionally accompanying big-ticket sales suggested that many bucks were changing hands. Later, I heard that the sales total amounted to over fifty thousand dollars.

I particularly enjoyed having the opportunity to talk with a number of people I've wanted to meet for some time. These included Alice Tannenbaum of the A.G. Tannenbaum Company (service data and parts), Alan Douglas (Author of *Radio Manufacturers of the 1920's*), Dick Mackiewicz, conductor of our *Dick's Corner* column, David Rutland, author of Behind the Front Panel (see the review in Dick's August column) and George Fathauer, Jr. of Sonoran Publishing.

I also had enjoyable talks with a few of our readers, including Tom Pamula (Erie, PA), who was trying to restrain his wife from buying up a good piece of the auction, David Poland (Columbus, OH), who provided me with quite a bit of information about a Scott *Imperial Allwave* that I own but didn't know much about and Larry Horvath (Milford, MI).

It was also a great pleasure to renew my personal acquaintanceship with just a few of the dedicated AWA officers (notably Lauren Peckham, Bruce Kelley and Bill Fizette) who contribute so much of their time and energy to making each AWA Rochester Conference a bit more memorable than the last.

AES Announces 1995 Catalogue

Antique Electronic Supply is now distributing its 1995 Catalogue, which has been expanded to 36 pages. Listed are over 3,000 electronic tube types plus an extensive line of capacitors and other items needed for the restoration or construction of tube-type equipment. AES also stocks over 75 book titles covering antique radio collecting and restoration and related subjects. For further information, contact Noreen Cravener, Antique Electronic Supply, 6221 South Maple Ave, Tempe, AZ 85283. Telephone (602) 820-5411. FAX (800) 706-6789.

MONTHLY MINI QUIZ

Match wits with our quiz editor! See next month's issue for the answer, as well as the names of all readers who responded correctly.

In 1876, this Yankee experimenter invented an "aerial telegraph" which was, in fact, an early wireless device.

Answer to last month's quiz: Vladimir Zworykin, 1889-1982

Conducted by Julian N. Jablin

VINTAGE BOOK REVIEWS

Books from the era when vintage radios were new! Look for them at swap meets, flea markets and used book stores.

THE WIRELESS EXPERIMENTER'S MANUAL incorporating How to Conduct a Radio club, by Elmer E. Bucher. Published by Wireless Press, Inc., New York, NY. Revised Edition 1920. Hardbound.

One of the classics of the pre-broadcast era, this book is much sought after by the early radio historian and researcher. It was written for the radio amateur market which, at that time, included just about anyone working with radio except commercial and marine operators. Unlike many other radio books of the era, this one does not start out with an elementary course in electricity.

Instead, the first chapter advises the beginner about how to get started in radio, suggesting that he join a radio club, learn the code and regulations, and build a simple receiver. This is followed by a chapter dealing with the formation and operation of a radio club. Chapter 3 introduces spark gap transmitter theory, presenting all of the graphs, formulas and tables needed for design, construction and testing.

The next chapter puts the theory into practice, covering the constructional details of building various types of spark transmitters from large, powerful units to small buzzer sets. Following a short chapter on the constructions of aerials and masts, the book delves into receivers. Chapter 6 discusses the theory, construction and operation of crystal, electrolytic and magnetic detectors. There are even sections devoted to the filings detector (a modernization of the coherer) and a primary cell (battery) detector. Chapter 7 moves on to Fleming Valve and Marconi VT circuits. Many of the early regenerative and non-regenerative circuits are shown, including the deForest Ultra-Audion, Weagant's X circuit and various multi-tube circuits. Next comes a chapter that covers special receivers for CW and undamped wave transmissions. Many of these use mechanical means to make the signals audible. The interesting chapter that follows discusses radio telephony and the various ways of constructing the wireless telephone transmitters of that era.

Chapters 10, 11, 12 and 13 are devoted to cabinet receivers (home-built types), test and measurement equipment, loop aerials and direction finders, static eliminators and underground aerials. The final chapter covers setting up long-distance relays by amateurs and lists various high-powered stations that were in operation at that time. At the back of the book are various useful tables and some interesting radio-related advertisements.

Bucher's book gives the reader an excellent insight into the field of radio as it was just before the beginning of broadcasting. To understand the many equations, one should be able to handle simple algebra. On the practical side, I'd recommend that any person wishing to get a feeling for what radio was like in 1920 construct some of the apparatus mentioned in this book.

This is a book of high merit. It's not a picture book for those who want to look at early commercial apparatus as there is very little of that mentioned. But the experimenter/recreator will find dozens of practical and instructive circuit diagrams representing wireless state of the art in the early 1920's.

Conducted by Paul Joseph Bourbin

COMPANY CHRONICLES

Brief Biographies of Classic Radio Manufacturers

New and Improved FRESHMAN MASTERPIECE

Charles Freshman had already made and lost several millions in various business operations when, in 1922, he founded the Charles Freshman Company to manufacture radio condensers and antennas. Over the next couple of years he expanded operations, adding crystal detectors, variable grid leaks and other parts to the line. During 1923 and early 1924, as sales of "3-dialer" sets began to soar, Freshman's engineers figured out a clever and inexpensive way to control the self-oscillation that plagued such designs. Depending only on ingenious placement of the r.f. transformers in relation to the tuning condensers, the Freshman design avoided the expensive Neutrodyne circuitry that was the conventional solution to the problem.

The result was the Freshman Masterpiece, a "3-dialer" that blew away the competition by selling for just $60.00 (or $17.50 in kit form). In production by August, 1924, enough Masterpieces were sold by the following February to gross almost $500,000 -- more than the figure for the entire year of 1923. Even though Freshman's relentless cost-cutting had begun to compromise quality (150 to 200 sets per day were being returned for repairs), the public was still buying.

In 1925, Freshman increased profits by cutting out his jobbers and selling dealers direct. He also undercut, and enraged, his dealers by introducing the cheaper "Polydyne" (really the previous season's Masterpiece) to be discounted by department stores. Sales were 7.3 million for 1925 and 7 million for 1926 -- but the 1926 profits were only about half of the previous year's.

By the end of 1926, sales were slumping because the 3-dial models had become obsolete. A new single-dial set was rushed into production the following March, but the firm broke its stride again when it was forced into accepting an RCA license in June. The required switchover to RCA tubes was expensive and, to make matters worse, power pack quality in a new a.c. set design was so poor that the return rate was said to be about 60%.

By November, 1927, 900 employees had to be let go and, in that year, Freshman lost $461,000 on sales of 7.3 million. Walter Chrysler, who had become a major investor in the firm, now purchased a controlling interest and instituted a management shakeup. Freshman himself was kicked upstairs to be chairman of the board, and was totally out of the company by September, 1928. Near the end of the year, Freshman absorbed Freed-Eisemann. Freshman's low-priced line and Freed-Eisemann's quality one complemented each other nicely. The Freed-Eisemann brand name was retained, but the corporate name became Earl Radio Corporation and the Freshman brand became "Earl" (for Clarence Earl, Freshman's replacement as President).

Sales began to improve and the outlook looked good--until the stock market crash finished off the newly-revitalized company, which went into receivership in November, 1929

The information for this Company biography was obtained from Alan Douglas' three-volume encyclopedia "Radio Manufacturers of the 1920's," published by The Vestal Press, Ltd., Vestal, NY and copyrighted 1988, 1989 and 1991 by Alan Douglas.

CLASSIFIED ADVERTISING

Subscribers may place one free classified ad, up to 30 words long, in each issue. Count your name, ham call (if desired), complete address and one phone number as six words. Additional words are 15 cents each per issue. Non-subscribers pay 30 cents each per issue for all words. Free ads will be automatically run in two issues, but expire after their second insertion unless renewed by mail or phone. Those wishing to run the same ad for extended periods of time may want to use a "business card" space (see Display Advertising Dimensions and Prices table elsewhere in this issue). This is a boxed area in which we can print your business card or any advertising message that will reasonably fit (no charge for setting type). We reserve the right to make editorial adjustments in classified ads without advance notification and to refuse advertising at our discretion. We will reprint, without charge, any ad containing typographic errors, but assume no other financial responsibility.

Wanted Good clean copy of Rider's Vol 19, 20 and 21. Top price paid. Charles F. Brett, 5980 Old Ranch Rd., Colorado Springs, CO 80908. (719) 495-8660.

Wanted old radio headphones and headphone plugs. Highest prices paid. Examples: I will pay $20 for BASCO headphones, $25 for Long Distance headphones, $25 for Bronston headphones. Will pay $10 each for Federal headphone plugs. I will buy bulk assortments of headphones, plugs and parts. Dick Mackiewicz, 1549 N. River Rd., Coventry, CT 06238. (203) 742-8552.

Wanted Buyers/sellers of WWII military radio sets and accessories. America's WWII radio surplus leader. Sam Hevener W8KBF, "The Signal Corps," 3583 Everett Rd., Richfield, OH 44286-9723. (216) 659-3244 before 8PM.

Wanted Red dial pointer for Airline 62-274 as illustrated in Bunis II. Samuel Zuckerberg, 578 Fifth Ave., New York, NY 10036.

For Sale excellent reproduction of 1920's S.S. Kresge crystal set blueprint $4.00 including postage. Dick Mackiewicz, 1549 N. River Rd., Coventry, CT 06238. (203) 742-8552.

For Sale 215A $20, VT-1 $60, 300A $12, 371A $12. All good filaments, 300A and 371A test good. Send for free list of radios, books, tubes, parts, etc. Can rejuvenate 01A, 99, 20, 10, 71A for $1.50 per tube. Stan Lopes, KB6LGV, 1201-74 Monument Blvd., Concord, CA 94520. (510) 825-6865.

For Sale Transistor novelty radios. Send a long SASE to Gary Arnold, 615 Oak St., Marion, NC 28752. (704) 652-6893

For Sale Vintage radio parts, test equipment, crystal detectors. We have a new open type adjustable detector! SASE for list. Dick Mackiewicz, 1549 N. River Rd., Coventry, CT 06238. (203) 742-8552.

A PRE-POWER WORKUP . . .
(continued from page four)

ponents, I'd suggest not attempting to take apart the soldered joints. This invariably requires excessive heat that melts or burns wire insulation, takes the temper out of spring contacts and generally makes a mess. Clip out the old component leaving half-inch stubs protruding from the connection points. To connect to such a stub, support the proper lead from the replacement component next to the stub and parallel with it, then solder in place. Most discussions of soldering insists that joints to be soldered should first have mechanical strength, but this works fine.

Step 10. (Note 1) When replacing can-type units, keep in mind that they very frequently contain more than one capacitor. Read the information on the side of the can, if given, very carefully to determine component specifications and terminal codes. If the information is not printed on the can, refer to the schematic. (Note 2) Modern components are so much smaller and lighter than the originals that you may well be able to support the replacement electrolytics on their own leads, avoiding the use of terminal strips. If long component leads are necessary, be sure to insulate them with "spaghetti" tubing to avoid the danger of short circuits. If it seems appropriate to install a terminal strip, consider using an existing component mounting screw to mount the strip before deciding to solder.

Step 11. (Note 1) Dynamic speakers were used by most earlier sets; check your schematic to verify. (Note 2) Most of the time, the output transformer was mounted on the speaker and so it is missing too. However, check your wiring because this transformer may have been mounted under the chassis and thus may not need replacement. (Note 3) A power resistor used to replace a speaker field is likely to get very hot, so don't mount the resistor too close to capacitors or other heat-sensitive components.

Step 15. The tube pins and tube socket contacts are likely to be oxidized, so spray some tuner/control cleaner on the pins and contacts, then insert and remove the tube several times prior to installation.