OSCILLATOR

DELAWARE VALLEY HISTORIC RADIO CLUB

The Official Newsletter of the DVHRC — Editor: Ludwell Sibley

Vol. 3 No. 11, December 1995

THE MONTHLY PREZ

Mike Koste

We close out 1995 with a celebration! Not only is it our Annual Meeting to vote for the DVHRC's Board of Directors for next year, but Dec. 12 is the date to break bread with your fellow members at our first-ever Christmas party! Bring your appetite and an entry for the Ugliest Radio Contest and compete for a $10 cash prize. (Incidentally, that's ugly by design . . . not by condition, neglect or tasteless customizing!) If you care to bring along some sweets to add to the hot buffet, they'd be welcome. Our customary monthly auction will follow.

On behalf of the Officers and Board, have a safe, peaceful and joyous holiday season!

NOMINATION OF CLUB OFFICERS FOR 1996

Ted Sowirka

It's that time of year again. At our November meeting, the following club members were nominated as candidates for the post of director:

Dave Abramson	John Kern	Lew Newhard
Jim Amici	Mike Koste	Bill Overbeck
Pete Grave	Tony Molettiere	Ludwell Sibley

The DVHRC operates with five directors who elect members to the positions of president, vice president, secretary and treasurer. Each member in good standing is entitled - and encouraged - to vote for five of the above named candidates at the December meeting.

SWAPMEET REPORT - DVHRC, NOVEMBER 18

Dave Abramson

What do you get when you mix a swapmeet with cold, grey skies, and some stiff competition from a nearby radio auction? You still get a successful swapmeet if bolstered by dedicated DVHRC members, good publicity, a beautiful GE raffle radio and more people interested in the DVHRC.

We had 18 vendors selling and auctioning their wares. "Someone" sold "something" because I kept seeing items leaving in cradling arms or wrestled into trunks. The raffle radio, beautifully refinished by Hidden Treasures of Souderton, drew a crowd and a look from everyone coming to the meet. Besides drawing attention, it attracted $156 in income: far and away a record and an endorsement for the raffle (and console radios in general). The winner was Denny Moore of Sellersville, who works for Tony and Sylvia. All in the family. Total income was $257; expenses, about $190.

Looking to the future, I have had some preliminary talk with the Downingtown Auction about combining an auction (they are planning more) with our swapmeet. There is much interest and it appears it would be very easy to do. The Board will look into this further.

And, finally, I received numerous calls about the meet and about attending future monthly meetings. I gave inquirers the information, so please look around at the next meeting and welcome new attenders to the DVHRC.

UPCOMING MEETINGS

Tuesday, Dec. 12 and Jan. 9, 7:30 PM, at North Penn Amusements, 113 Main St. (PA Rte. 113), Souderton.

JOINING THE CLUB

Just send $10 to DVHRC, Box 41031, Philadelphia, PA 19127-0031.

ADS & SUCH

Please send ads, articles, etc., to Ludwell Sibley, 44 E. Main St., Flemington, NJ 08822, (908) 782-4894. For urgent items, we have a fax machine on this same number.

ON THE HORIZON

Jan. 16	NEARC Swapmeet, Nashua, NH
Feb. 25	Greater Boston Area Radio Collectors "Radio XXVII," Westford, MA
March 16	NJARC indoor swapmeet, Hightstown, NJ

AUCTION REPORT - DOWNINGTOWN

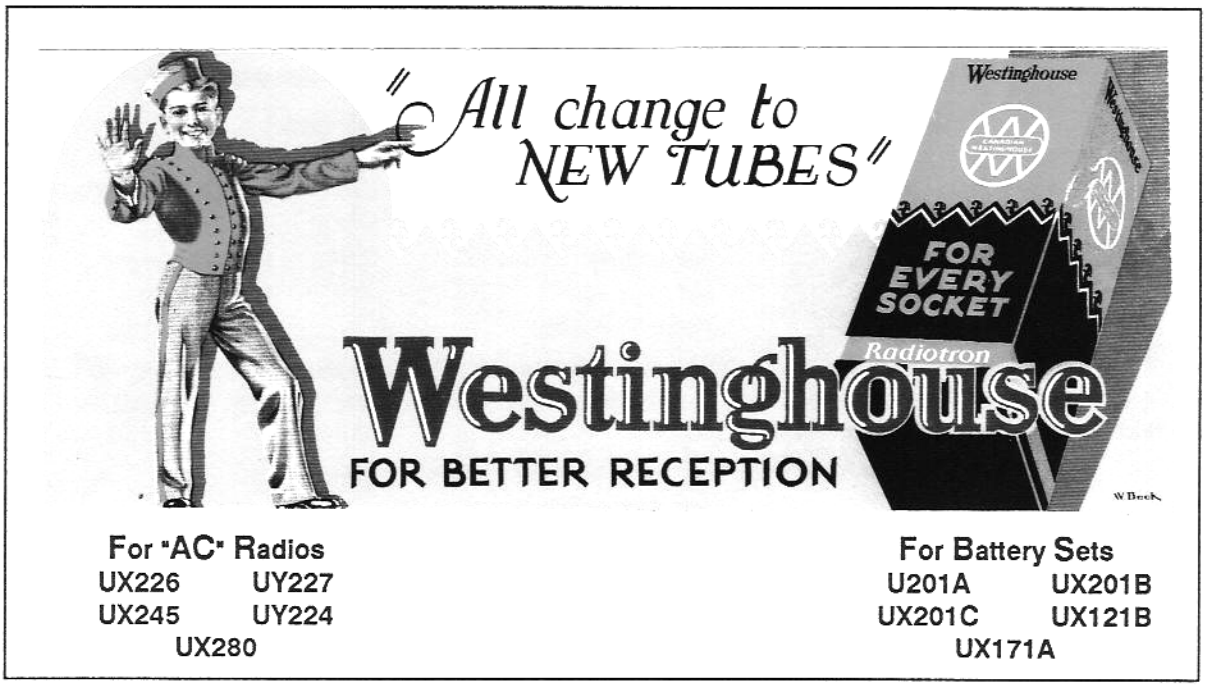
The Smith Auction Co. catalog auction in Downingtown on Nov. 18 was reported by several DVHRC members as offering a well diversified array of good radios (etc.) at prices that generally tracked the quality of the merchandise - but there were some bargains too (sounds like their previous 1995 event.). This auction house tries to run two radio sales a year, and bears watching for next year.

ATTENTION RADIO AMATEURS

Bruce Kelley, W2ICE

If you have 160-meter capability, listen for (and work) Antique Wireless Association station W2AN on Saturday, Dec. 9 between 7 PM and midnight around 1815 kHz CW.

Members have constructed a near-duplicate of the famous 1BCG transmitter which sent the first amateur message across the Atlantic in December, 1921. A full description of the station can be found in the Feb. 1922 issue of *QST*. A special QSL will be sent for all contacts. QSL to: Bruce Kelley, AWA, 59 Main St., Bloomfield, NY 14469.



"INDUSTRY" NEWS

AWA GETS NEW OFFICERS

The Antique Wireless Association, as of its Nov. 5 board meeting, has new faces in charge, both of them from Pennsylvania. Bill Fizette, K3ZJW, is the new president - and is only AWA's fifth president in 43 years. DVHRC member Ron Frisbie becomes vice president. For a permanent, professional editor for the *Old Timer's Bulletin*, the board ratified the selection of Marc Ellis. Marc is best known as antique-radio editor for *Popular Electronics* and as publisher of *The Radio Collector* bimonthly. He will be assisted by a review committee which will screen proposed *OTB* material for suitability. President Fizette will remain editor of the AWA Review.

The board also approved an expansion of the Annex storage facility for its museum and addition of climate control. To fund the increased operating expense from the added facility, membership dues will be raised to $15 per year ($27 for two years) effective May 1.

AUCTION - BELLEPLAIN, NJ

The auction that Classic Liquidation and Auction Service had planned to present on Nov. 18 has been deferred to January or February. We'll have the new date as soon as it's available.

Election this month!

WANT ADS

Free exposure for your desired or unwanted stuff! Unless requested otherwise, we'll run each ad for two months, and will send ads to NJARC's *Jersey Broadcaster* for double coverage.

FOR SALE: RCA Radiola 18, works, $60; Philco 40-190 console, $100; RCA 100A speaker, cloth indented, $20. Amy Lancaster, (215) 348-9654. (12-95/1-96)

FOR SALE: The DVHRC tube program offers clean, tested, boxed tubes at very reasonable prices with availability at any club meeting. Proceeds go to the club. About 295 types are currently in stock. Of course, donations of radio-type tubes in any condition are welcome. See Charlie Class at any monthly meeting to obtain or donate tubes.

WANTED: Help! I need a good looking split-second robot dial face and shutters for Zenith 12S265. My black paint is peeling. Also looking for original-type grille cloth and belts for the same radio. Does anyone know what other models I could use a dial face from? Mark W. Hilliard, N3NBL, 921 S. Edward St., Allentown, PA 18103, (610) 432-8089. (12-95/1-96)

WANTED: Phonograph-related items: top dollar paid immediately for Vogue picture records, wax-cylinder records, needle tins, Nipper, record cleaners, puzzles, advertising mirrors, pins, phonograph toys, posters, original advertising from Edison and Victor. Thanks! Bernie Seinberg, 714 Moredon Rd., Meadowbrook, PA 19046-1907, (215) 886-6124. (12-95/1-96)

WANTED: Probe only for Heathkit IT-12 signal tracer. Diagram booklet for Heathkit V-6 VTVM. Working probe for RCA WV-97A VTVM. Stan Thompson, 43 Cozy Corner, Avenel, NJ 07001-1122, (908) 636-3630. (12-95/1-96)

684 Forman Road
Building 'B'
Souderton, PA 18964
(215) 721-3990

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Deborah S. Froshour
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Antique Radios & Phonographs
Buy – Sell – Repair

Frank A. Johnson
FAIRLESS HILLS, PA
(215) 943-8295

COMMON-SENSE RESTORATION TIP

DIAGRAMS THE EASY WAY

Alton DuBois

Many times I have looked for a diagram of a freshly acquired radio before digging into it. I had requested a schematic on a Magnavox chairside, but was told it was not in Rider's. In turning the set upside down to get the chassis out - there was the diagram glued tightly to the bottom of the case . . . not removable with anything that would not destroy the diagram. Another set, a table-model Silvertone, had its schematic pasted on the inside of the chassis and the parts list on the outside! So, before you send away money, look first.

CLUB PHILOSOPHY

COMPUTING THE "DOERS"

Gordon Symonds, researcher/editor for the Ottawa Vintage Radio Club, has recently printed a tongue-in-cheek mathematical model to determine the number of "doers" in volunteer organizations - in the usual case where a hard core of enthusiastic members does most of the work. "Symonds' Law" can be written:

$$\#\text{ of Doers} \simeq 1.5 \times \sqrt[3]{(\#\text{ of members})}$$

This rule can be tested against actual clubs as follows:

Radio Club	# of Members	# of Doers (calculated)	# of Doers (actual)
OVRC	75	6	6 (?) [Estimate by Symonds]
DVHRC	145	8	9 (?) [SWAG by Sibley]
MAARC	1200	16	12 (?) [Estimate by Symonds]
AWA	4200	24	20 (?) [Estimate by Symonds]

He goes on to point out that the aforesaid enthusiastic volunteers will inevitably "burn out" if they stay in the same jobs year after year. Food for thought . . .

CONGRATULATIONS!

To Frank and Bobbie Hagenbuch, DVHRC's representatives in Williamsport, for the birth in November of daughter Sarah.

READERS' COMMENTS

William R. Jones

I stopped in at the Fall Swapmeet on Nov. 18 at Souderton. My time was short, so I could stay only a minute. However, I did pick up a copy of the *Oscillator* that I read over with interest. Congratulations for a fine job . . .

The article, "Shallcross Remembered," by Bob Thomas, W3QZO, I found very interesting. I have lived in roughly the same time frame, although Bob is maybe a few years older - my guess. I too worked for a company similar in management philosophy to Shallcross, as many of us did in the '50s and '60s. From the article, one can see the seeds of many beginning problems for the company, and then the final absorption. Actually, the article could be used as a classic "what not to do" for a business-management classs. Some of the old ways were simpler, direct, but not necessarily correct! . . .

I will tell you that in the '50s there were mountains of what we now call "classic" radios thrown on the scrap heap, many in excellent condition. (I know you oldtimers all know this!) I can also recall my father buying at auction the battery radios of the '20s for 50¢ each; then we would take them apart and salvage the screws, nuts, and bolts and trash the rest.

What an interesting time we have lived through!

BOOK REVIEW

HEATHKIT - A GUIDE TO THE AMATEUR RADIO PRODUCTS[1]

By Chuck Penson, WA7ZZE
Reviewed by Bob Thomas, W3QZO

Arriving home from another day at work, you immediately spot the carton on the kitchen table. Your new Heathkit has arrived! Shucking your jacket, you are overcome by a rush of anticipation as you deftly slit the carton open. Lifting the yellow Heath Assembly Manual from the uppermost tier of your new treasure-trove, the exotic aroma of phenolic and vinyl insulation, still-curing paint, transformer varnish, and all those resistors and condensers, wafts upward - all to heighten anticipation of things to come.

*You notice small brown bags, each stuffed with a different kind of component, but it is a rotary switch that grabs your attention. Fondling the switch and marveling at its complex rotor contacts, you can already begin to hear snappy DX replies to your CQs. And the meter, whether Readrite or Weston (with genuine d'Arsonval movement) stirs visions of dipping a final or peaking a received station as controls are expertly manipulated on the completed kit. **POP!** A dinner call breaks your trance, but not for long; your kit will soon be assembled and operating. Happiness is a Heathkit!*

Fortunate is the person who has experienced building a Heathkit. Fortunate too, is anyone who has a copy of Heathkit - A Guide to the Amateur Radio Products. In an article in *Electric Radio* magazine[2], author Chuck Penson describes how his book originated from a desire to simply learn more about the equipment he had collected, which amounts to about 120 of the 160 ham-radio kits issued by Heath. Ever-branching avenues of research led Penson from a search through back issues of *QST* to interviews with present and former Heath employees, access to company files, records from a defunct Heath store, and purchase of hundreds of Heathkit manuals from a hamfest vendor. The basis for a book materialized, and Chuck wrote a detailed description of each model and personally photographed every available unit in the Heath amateur line. Barry Wiseman, editor and publisher of *Electric Radio*, joined Chuck at that point to publish the book reviewed here.

The 248 pages of this new 8-½" x 11" soft-cover book are divided into three sections: a brief history of the Heath Company; an illustrated review of all 160 products related to ham radio, accounting for the major part of the book; and a comprehensive list of over 1000 references to reviews and modifications of Heath gear in *QST* and *CQ* magazines. The 30 or so pages devoted to a history of the Heath Company tell of an organization that began not unlike a large family where, through the phenomenal success of pioneering products like the AT-1 and DX-100 transmitters, the financial and technical foundations of the company were firmly established. Success in the amateur market with a torrent of new products from late '50s to early '70s gradually forced a shift away from the friendly family atmosphere to a more formal corporate structure. Eventually, rapid advances in technology caused unacceptable delays in product development and unmanageable complexity in kit construction, just when offshore competition was heating up. Acquisition of the company by Zenith, which bought Heath for its computer expertise, with no interest whatever in the Amateur Division, finally spelled the death of Heathkits as we knew them. Chuck Pen-

Election this month!

son has woven these exciting corporate wars, and intimate fascinating tapestry. But that is yet to come!

Product reviews are, of course, times of personalities, products, inside stories into a colorful, only the beginning; the best is the *raison d'être* for this book. In a word, they are fantastic! All Heath amateur products are arranged, generally one per page, in alpha-numeric order from AC-1 Antenna Coupler to VX-1 Voice Control (VOX). Model numbers are printed at the top of each page to facilitate rapid searching. The upper half of most pages is devoted to a photograph of the equipment taken from an angle that best depicts control layout, cabinet construction and other features of interest. These are no ordinary snapshots, mind you, but sharp, virtually shadowless photographs selected from numerous exposures made by the author. They clearly convey small mechanical detail, the lettering on panels, meter scales and tuning dials, and finish texture. The only exceptions are where equipment in good physical condition was unavailable for photography, in which case a reproduction of a catalog illustration is incorporated with appropriate caption notation. Products that were upgraded by Heath with revised circuits or restyled cabinets (the DX-60, -60A and -60B, for example) are illustrated with adjacent photographs of each model to enable the reader to quickly identify their subtle differences. Another example of product comparison is inclusion of all three versions of the GD-1 Grid Dip Meter in a single photo.

Below each photograph a large-type title gives the name of the equipment, and below that, manufacturing dates and price. Captions at the end of each product review provide dimensions and weight and a very useful list of related products, i. e., various versions of the same product and compatible accessory equipment.

Penson's descriptive text for each kit is where the greatest value of this book resides. When it comes to Heathkits, Chuck has been there, done that, seen that, knows that, and generously shares his store of knowledge with us. His comments begin with a brief background on how and why each kit was developed and how it fared in sales. This is followed by concise descriptions of circuits, frequency ranges, mechanical features, and a summary of product strengths and weaknesses. Where appropriate, comparisons of circuit details are made with predecessor and successor products of similar types. Finally, tips are given on how to discriminate between minor differences that often set one product apart from a nearly identical second version. Information of this type is especially useful when related to internal changes which might not be visible in a flea-market inspection. For example, if you would like to acquire a Heath 5-band SSB/CW transceiver (Heath issued seven models!) but don't know which model best meets your requirements, an excellent analysis of similarities and differences can be found by referring to the ten pages of comments and photos for the HW-100, -101, -104, SB-100, -101, -104, and 104A. Make a few notes, take them along to future hamfests or have them handy when scanning "For Sale" ads, and you will be equipped to make an intelligent decision when one or more transceivers become available.

Hams wouldn't be hams if they didn't modify their gear. Kit-built equipment is probably more susceptible to modifications than factory products simply because the builder has some familiarity with the inner workings. It is not surprising, then, that back issues of amateur-radio journals are replete with suggestions for modifications to Heathkits, some of which, according to the author, were incorporated by Heath engineers in subsequent product designs. To assist owners of Heathkits, Penson included a chart at the end of his book listing Heath model number, *QST* and *CQ* issue dates and pages, and a brief description of the reason for the modification. This list is followed by a clever chart illustrating the production life spans of most amateur-related products manufactured by Heathkit.

As might be expected of any first printing, a few minor gaffes appear in the book. The most obvious, if only because of its prominence, is use of "Forward" for the heading of the preface, rather than the correct "Foreword." Page 144 of my copy is completely blank where one would expect the HW-101 description to appear between the HW-100 and HW-104 - a printing glitch that is being corrected with a paste-in page for present holders od the book and for future buyers. Finally, it's ironic that, with his superb photography throughout the book, the author's own picture accompanying his biography on the rear cover is a soft, muddy, out-of-focus snapshot that does not do justice to the very one who gave so much of himself to make the book possible.

So much for nit-picking. A genuine fear stemming from Chuck's book is that it will so heighten respect for and interest in Heathkits that we will see their values soar in classified columns and the hamfest circuit. If that happens, so be it; they might well be worth more than their presently depressed prices indicate. Heathkit - A Guide to the Amateur Radio Products will stand as *the* definitive work on its topic for years to come. Obviously born of a labor of love, it is destined to endure as an indispensable dog-eared reference in home libraries and hamfest backpacks.

REFERENCES

1. Electric Radio Press, Inc., Box 57, Hesperus, CO 81326, $24.95 + $3.00 shipping; or (same price) from *Antique Radio Classified*, PO Box 2, Carlisle, MA 01741, 508-371-0512, cards accepted.
2. Chuck Penson, "Writing the Book," *Electric Radio*, No. 77 (Sept. 1995) 29-31. *Electric Radio*, Box 57, Hesperus CO 81326.

RESTORATION TIP

OSCILLATOR/METER SURGERY

Alton DuBois

Years ago (1939), I learned to use an oscillator and multimeter unit. Eventually, the store owner gave it to me as one week's pay. I still have the multimeter but it's long out of usability. The only thing of value in it now is the meter movement. Recently I say one on a surplus list and bought it - no manual, and I found that the meter was open. I could have returned it, but was determined to keep and restore it.

Since no circuit diagram was available, I had to do some research, and decided a 200-microamp meter might do it. I bought a 200-μA meter of the right dimensions and scale size, and transferred the scale from the defective meter. Lo and behold! - the system was just about correct on all settings (sheer luck!).

Later on, I saw the same kind of unit in another surplus list and bought it because it came with a complete manual. The instrument was a National Radio Institutes training unit, ca. 1940. It was called the Professional All-Wave Radio Tester, Model 1175B, made specially for N. R. I. by the Triplett company. the manual is a very complete booklet on its use, including the way to read the settings and measurements. The RF oscillator dial is fairly easy to read, but the VOM meter is different from those on many later models. You really have to understand the calibrations to get the correct reading, right down to counting the fine lines. I would say that it's a complicated system for a beginner, but once he learns it, it's very accurate.

These units, at the time they were produced, were about all a radio man needed to service the average home radio set. If anyone has an N. R. I. 1175B tester by Triplett, without a manual, I'd be glad to copy it for the cost of copying, about 30 sheets at 5¢ per sheet, plus postage. (Address: 67 Peggy Ann Rd., Queensbury, NY 12804)

RESTORATION TIP

FUSES - IN AND OUT OF THE CIRCUIT

Ted Sowirka

The cartridge fuse used in most electronic equipment is a glass or ceramic tube, with the fuse inside made of a low temperature melting alloy, which is non-renewable, supported by metal end caps. Fuses are made in various sizes and ratings, the most popular style being ¼" diameter and 1-¼" long. Ratings range from 1/32 amp to 30 amps. Some have wire leads fastened to the end caps.

I have never seen a fuse in a five-tube AC-DC radio or in most other radios. Fuses show up in high-end radios, auto radios, audio amplifiers, test equipment, TVs, VCRs and other electronic devices. Most equipment has the fuse rating marked with a label or on the fuse holder. The fuse itself is marked on the end cap. A fuse can be a quick-blow type or slow-blow, which can withstand greater surge currents without blowing. Always replace with the manufacturer's suggested type and rating.

If you have or buy a piece of equipment which has a blown fuse, don't just replace it: troubleshoot it for the cause of the fuse failure. You can measure the continuity of a fuse with an ohmmeter if it has a rating of 1/8 amp or higher. With some ohmmeters you may blow a 1/32 or 1/16 amp fuse on the R x 1 range.

During the early '50s at Philco, four to five million TV sets were made, with one or more fuses installed in each set. Purchased materials and parts were sample-tested in the PMI (Purchased Material Inspection) department, which was part of Quality Control. Scotty, the PMI manager, had an inspector named Jack who tested fuses by using a fixture: a board with cadmium-plated finishing nails driven 1-½ inches apart so that 100 fuses with wire leads could be soldered in series. A voltage source with an ammeter was connected to the string of fuses and terminated with a load. Jack would bring up the voltage, noting the current, until the first fuse failed. He would short the blown fuse with a piece of bus wire and continue the process until all the fuses had blown. Jack found that a few fuses failed to blow with 10 times the rated current flowing through them. You cannot test a fuse at its rating. Chances are that it will open or blow (if it was properly made), rendering it useless. The best you can do is check it for continuity at lower current and hope the manufacturer did his job properly.

If you have a valued antique radio without a fuse, installing a holder and fuse is easy. Usually it is placed in series with one side of the line and the primary of the power transformer. The rule of thumb is to rate the fuse at 150% to 200% of normal operating current. Fuses are not cheap, but neither are 50- to 60-year-old power transformers.

MORE FUSE HINTS

A. Always inspect fuses in a freshly acquired piece of equipment for the correct size. I once bought a Navy RBO receiver and happened to inspect it before plugging it in. Good thing, too: the fuse had been replaced with a piece of brass rod cut from a volume control. (Better yet: some fool had wired one side of the AC line directly to the steel case! Death, anyone?) My Navy RAS receiver had been "up-fused" from one amp to 15 amps. Fuse cognoscenti refer to this as not a slow-blow, but a "no-blow."

B. With an extractor-type fuse holder, the really suave tech inserts the fuse with the amp rating visible outside the extractor. This saves a step in checking the fuse size later.

C. The ¼" x 1-¼" glass-type fuse that restorers usually need was originally termed "3AG," and one major maker still calls it that. It is also known as "AGC" (fast-blow) and "MDL" (slow-blow). In sorting through fuses found in the flea market, say, you will find numerous other styles that are largely useless. The SFE style can be handed over to your friend who restores old cars. Fuses bigger than four or five amps are useful mainly in transmitters, appliances, etc. - not in radios.

D. Some equipment has a '40s-vintage wall plug containing a pair of fuses, one in each side of the line. Some other gear (e. g., the RAS receiver noted above) has similar dual fuses internally. The normal inclination is to use fuses of the same size. This means that, in an overload situation, both will probably blow. Better practice is to make one fuse the right size to protect against overload (the 150% - 200% of normal load quoted above), and the other one somewhat larger - say, 1 amp and 1-½ amps respectively. This will save the power transformer as desired but will take only one replacement fuse. It will still protect against line-to-ground short circuits: one fuse or the other will still blow.

E. Present-day digital multimeters - Fluke 77 or Micronta 22-174, for example - apply very gentle test currents (less than one mA), and are thus safe for testing small-sized fuses, even the 1/200 amp instrument type.

F. According to the manufacturers, a slow-blow fuse is expected to carry twice its rating for several seconds. A typical fast-blow fuse is rated to carry 110% of its nominal current indefinitely, and to open in one hour at 135% To check up on this, five 1-amp old-stock fuses chosen from five separate boxes of varying manufacture were tested at the DVHRC Hall of Science by wiring in series from a current source. The first ran several hours at 1.1 amps before opening. The next three took 1.2 amps for a couple of days before blowing. The last one handled 1.35 amps for a day, took 1.8 amps for half an hour - the internal wire glowing a dull red, no less - and then blew on raising the current to 1.9 amps! Looks as if these are not exactly precision-calibrated devices.

G. An open fuse *may* hint at the cause of its "popping." A simple melting-open of the fuse wire means a slight or moderate overload. A black or silvery deposit inside the glass normally indicates a severe overload, usually a short circuit. However, of the five fuses tested above, one showed the full blackened deposit despite the mildness of the overload.

H. Corrosion of the end caps may mean that a 50-year-old fuse has simply failed, or gotten weaker, through chemical action while stored in a moist location. (Always test freshly acquired but old fuses for continuity before putting them in stock - they can "go open" from non-visible corrosion under an end cap. You don't need to be mystified as to why a dead piece of gear still didn't work after you replaced the fuse!) Fuses handling heavy start-up loads - motors or transmitters, say - can develop recrystallization or metal fatigue after several thousand starts and simply give up.

I. Equipment in the flea market often has the extractor part of a fuse holder missing or broken. It is wise to keep an assortment of miscellaneous extractors on hand - always salvage the extractor from a piece of gear that is to be junked.

J. Some radio parts have "hidden" fuse functions. In an AC-DC radio set, the "pilot" section of the heater in the 35Z5 or 35W4 provides UL-recognized fuse action in case the input filter capacitor shorts. - LAS

MADE IN PHILADELPHIA

. . . AND YOU THOUGHT AK MADE JUST RADIOS!

The Atwater Kent Manufacturing Company had been around a long time before the "radio craze" broke out. Alan Douglas' Radio Manufacturers of the '20s, and other sources like Ralph Williams' AK history in *Radio Age* some years ago, point out the variety of pre-radio products made by this firm: electric fans, sewing-machine motors, intercom telephones, watch-case style electric meters and (in WW I) artillery theodolites. But AK's biggest pre-radio success was ignition systems for cars. An 18-page catalog recently found, dating from ca. 1920, lists a wide variety of "Scientific" ignition systems and parts. Here were the available variations:

Election this month!

For Ford Cars (1919 or later models equipped with Starting and Lighting Systems
For Ford Cars (prior to 1919) not equipped with Starting and Lighting Systems
For Maxwell, Overland and other cars equipped with Starting and Lighting Systems
For Engines at present equipped with Atwater Kent Open Circuit Type K-2 and K-3 Ignition
For Engines equipped with vertical distributors and also equipped with Starting and Lighting Systems
For Engines equipped with Magnetos and also equipped with Starting and Lighting Systems
For Engines equipped with Magnetos and not equipped with a generator to keep a battery charged
For Engines equipped with vertical distributors but not equipped with a generator to keep the battery charged
For Marine Engines (Type H)
For Tractors, where normal speed of the engine is over 500 R. P. M., Type K-3
For Tractors, where normal speed of the engine is less than 500 R. P. M., Type H
For Franklin Cars previously equipped with Atwater Kent K-2 Ignition
For Chevrolet Cars, Model 490 (1916-1920)

ATWATER KENT

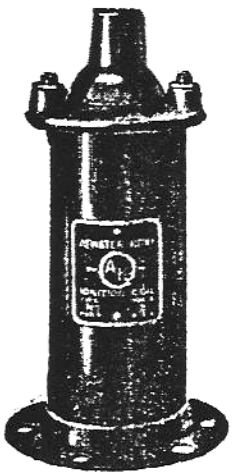

Fig. 1 Universal Coil with End Mounting

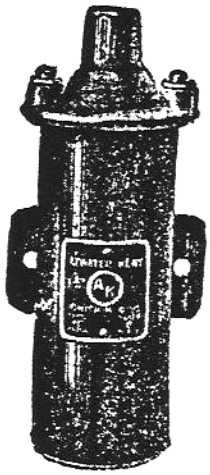

Fig. 2 Universal Coil with Side Mounting

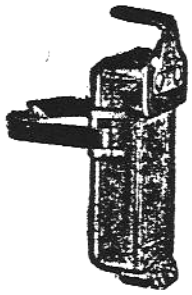

Fig. 3 Separate Universal Condenser Unit

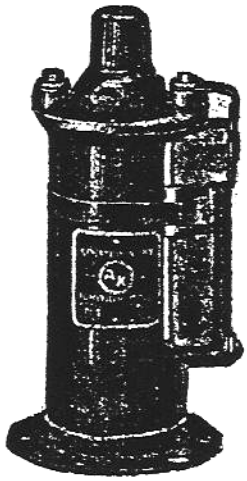

Fig. 4 Universal Coil with End Mounting and Condenser

DVHRC
Box 41031
Philadelphia, PA
19127-0031

Election this month!