

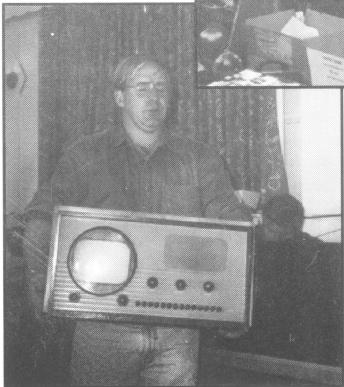
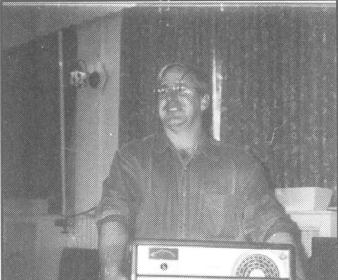


New Jersey Antique Radio Club News

Volume 3

Winter 1994-1995

Number 1



In this issue:

- Auction Results
- Historic New Jersey
- Restoration Hints
- Meeting Reviews
- Classified Ads
- Homage to ARCA

The New Jersey Antique Radio Club *News* is published quarterly, on a volunteer basis, by and for members of the New Jersey Antique Radio Club. It is distributed by mail to club members. NJARC can not be responsible for transactions between buyers and sellers advertising in the newsletter.

Dues and address changes: Kathleen Flanagan, Secretary, 92 Joysan Terrace, Freehold, NJ 07728, (908) 462-6638. Make check payable to NJARC. Dues: \$15 per year (includes subscription to NJARC News). A one-dollar donation is collected at each meeting to help offset the cost of the meeting space rental.

Newsletter Articles, Classified Ads: David Sica, Newsletter Editor, 1459 St. Georges Avenue, Rahway, NJ 07065 (908) 382-0618.

Swapmeet: Jim Fisher, 344 Harrison Avenue Manville NJ 08835 908.725-7476

Official Business: Tony Flanagan, President, 92 Joysan Terrace, Freehold, NJ 07728, (908) 462-6638

Officers

President: Charles A. "Tony" Flanagan, Jr. (908) 462-6638

Vice President: Michael Hammer (908) 255-7865

Secretary/Treasurer: Kathleen Flanagan (908) 462-6638

Technical Coordinator: Thomas Provost (609) 259-7634

Sergeant-at-Arms/Steward: Marv Beeferman (609) 693-9430

Newsletter Editor: David Sica (908) 382-0618

Trustees: Mark Mittleman, Ludwell Sibley

Calendar of Events

January

13 NJARC monthly meeting

February

10 NJARC monthly meeting

14 DVHRC monthly meeting

25 Central PA Radio Collectors indoor meet (tentative)

March

04 NJARC Indoor swap meet

10 NJARC monthly meeting

14 DVHRC monthly meeting

25 PARS "Spring Fever" Event

May

06 AWA Spring meet

June

09-10 MAARC "Radioactivity" (tentative)

MEMBERSHIP BENEFITS

- Monthly Meetings
- Technical Seminars
- Swap Meets
- NJARC News
- Free Buy/Sell Classified Ads
- Tube Program
- Capacitor Program
- Tube Testing
- Video Library Program
- Informal Networking with local collectors.

Monthly Meetings. Collectors in the New Jersey have an opportunity to get together with other collectors on a regular basis to keep abreast on what's happening in the field.

Technical Seminars. Featured presentations at the monthly meetings focus on issues related to collecting antique radios. In past meetings, we've covered topics from operating demonstrations of vintage equipment to restoration safety.

Swap Meets. Held 3 times annually, the NJARC Swap Meets have become the most eagerly awaited events of the year. Vendors from near and far gather to offer a rich and varied assortment of radios and related items for sale.

NJARC News. The club newsletter keeps members informed about club events, providing notice of upcoming activities, reviews of past events and other club-related information. The newsletter is a forum for member interaction, offering free classified ads to members and non-members alike for the purposes of buying, selling or trading radio-related items.

Tube Program. The club offers clean tested and boxed tubes to members at bargain rates. Tubes are available at each meeting, and all proceeds benefit NJARC.

NEW! Capacitor Program. NJARC now offers high quality capacitors at low prices to fill your restoration needs.

Tube Testing. Members can bring tubes to any meeting for free checking on a high-quality tester.

NEW! Video Library. Meeting presentations are documented on video tape. Members may borrow tapes from the club video library at no cost.

Networking. Collectors have an opportunity to get together with those of like interests to share tips, techniques, "war stories" and socializing. NJARC offers the opportunity for collectors from all over the area to share their expertise and their experiences.

LATE ANNOUNCEMENT: CENTRAL PA MEET - WILLIAMSPORT

This event will be on Saturday, Feb. 25, at Trinity Episcopal Church, 844 W. Fourth St. (use Maynard St. exit from I-180). Site is the second-floor gym. Hours are 9 AM - 1 PM (dealer setup at 8 AM). Both radios and phonos are welcome. Rates: general admission, \$1; sellers, \$3 per table. Food will be available. Bring a radio for the equipment display! Contacts for table reservations, etc.: Frank Hagenbuch, (717) 326-0932 [1440 Lafayette Pkwy., Williamsport, PA 17701]; or Mike Heffner, (717) 546-2907.

The museum next door opens at 11 AM; has a large display of model and tinplate railroad gear - Ives, Lionel, etc., in O/HO/Standard Gauge.

COVER: Some sprightly action in the November auction at Hightstown.

THE PRESIDENT'S BROADCAST

Tony Flanagan

Our club continues to thrive due to the dedication of many of our hard working members. Our swapmeets continue to grow, in both size and quality. These meets continue to be wildly successful events, both for the club and for collectors in this area of the country who have come to view NJARC meets as one of the premiere events in the radio collecting hobby. We have buyers and sellers not only from New Jersey, but also from neighboring states regularly attending our events and commenting enthusiastically about them.

Our financial health, due in no small part to income generated by these meets, is excellent. In fact, we've been able to eliminate our old policy of the club collecting a percentage of sales at the mini-swap meets held during our regular monthly meetings. This policy was instituted when the club was new and we had no regular source of income other than membership dues. At that time, we had no way of knowing that our swapmeets would be



as successful as they are (although we sure *hoped* they would be). In addition, we now have other "fund raisers" like the club tube program and the new club capacitor program which bring in a little extra cash to help defray expenses. We still collect a buck a head at meetings to help with the expenses we do have. Our regular expenses are small, but they are real. We continue to rent the hall from the church for our meetings. We get a very good rate on this - heated and air-conditioned, clean rest rooms and a nice sized meeting room with kitchen. We also provide "free" coffee and donuts at the meetings, and many of you were there for the Holiday party at our December meeting where "Santa Marv" loaded his sleigh with sandwiches, dips, chips and cookies for us to enjoy. All this came from the club treasury, funded by your dollar donations and the income from our events.

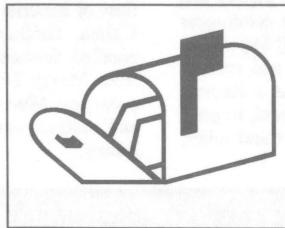
Although we're a non-profit, totally-volunteer organization, we still have plenty of expenses to deal with: we advertise our meets extensively (this is a good investment, as our meets are always well (Continued on page 17)

A LETTER FROM THE EDITOR

Dave Sica

With this issue of the NJARC News I return to the editor's seat, having taken a short "vacation" from NJARC due to my unsympathetic boss's demands. Guest editor for our last issue was club member, trustee, and tube chaplain Ludwell Sibley. Curiously, that particular issue somehow appears to be our best to date. Guess we reaped a windfall from all that *OTB* farm team work. Mucho gracias for the assist, Lud.

Another member putting his enthusiasm for the hobby to benefit us all is Jim Amici, who heads up our new club Capacitor Program. This new member service, modeled after the highly successful club tube program provides the *other* most-frequently-needed-but-sometimes-difficult-to-obtain radio restoration component. I'd like to applaud Jim for his volunteerism, but more importantly for his attitude toward the radio collecting hobby. Jim took the post of "capacitor-meister" only on



the condition that the program be designed to provide a good selection of high-quality components to club members at *affordable prices*. Like many of us, Jim is concerned, and somewhat appalled by the rapidly escalating costs associated with being a radio collector. With many sets priced "out of the market" for us mere mortals, and the cost of repair components like vacuum tubes and capacitors heading for the stratosphere, it gets harder and harder to feed the hobby. Although I have no quarrel with the concept of "dealers" or "collector/dealers" versus pure "collectors", I do agree with Jim's sentiments that costs have gotten out of hand due to the "profit" motive now prevalent in what many think was at one time a relatively "pure" hobby". If you agree or disagree with this reasoning, please write, and we'll publish some *Letters To the Editor* in an upcoming issue.

(Continued on page 18.)

FROM THE BOARD ROOM
HIGHTSTOWN FALL MEET REPORT

NJARC was favored with a brisk turnout and fine weather for the fall swapmeet and catalog auction on November 5 at Hightstown. Sellers occupied 67 tables outside and another 20 indoors, besides Pete Grave with his ex-bookmobile outfitted as a mobile radio showroom.

For the auction, the final catalog listed 314 lots (having grown by about 50 from the advance version), and bring-in sales were another 40 items. Walt Buffinton as auctioneer handled about 350 items in a smooth flow. The 102 bidders came from 10 states and spent \$8200. Prices varied, with prime material drawing strong interest, while groups of Photofacts, parts, and magazines were relatively cheap. There was no lack of tubes: 20 "flats" of boxed general-purpose and TV types went for only \$5-10 each, whereas high-interest, tested big-pin tubes brought active bidding.

A rather fine Atwater Kent breadboard, 10C model, fetched \$850. Eight early post-war TV sets got strong bids. The most collectible tube of the day was a VT-21 by De Forest (a bargain at \$55), seconded by a Western Electric 205D at \$75 and a classic WW I assortment (VT1, VT2, and CW-1344) at \$150. The estate of George Beers, receiver designer in the '20s and later vice president at RCA Victor for color-TV development, yielded several groups of unique papers and photos. One scarce item for the comm-gear crowd was a Hammarlund SP-400 Super-Pro, in fine shape, with power supply and speaker at \$160. Another real rarity was a Radiola VII-B (AR-907) regen receiver panel, in good shape; despite missing the cabinet and tubes, it drew \$375.

The following is an accounting of the funds generated from the event.

Income

Gross Sales, Auction	\$8,236.50
Table Rental &	1,396.00
Parking Fee	
Tube Sales	110.00
	\$9,742.50

Expenses

Auction Proceeds	\$6,757.92
paid to sellers	
Hightstown Country Club	350.00
Auctioneer	250.00
Advertising and	242.52
Postage	
Catalog printing	533.11
and distribution, motel room for auctioneer, auction cards & clerk's box.	
	\$8,133.55
Net Profit to Club	\$1,608.95

A jolly crew turned out to make the event happen. Staff included Jim Amici, Don Cruse, Jerry Dowgin, Pete Grave, Al Klase, Mark Mittleman, John Ruccolo, Dave Sica, Bill Stokes, Ruth Whartenby, and Phil Vourtsis. Rick Weibezahl provided the PA system for the auction and kept the flow of material smooth. Sammy and Mitch Cohen, familiar to MAARC auction-goers, handled finances for the auction with help from Marty Friedman. "Producer" for this event was Marv Beeferman. Auction catalog and cartage were by Ludwell and Marilyn Sibley.

MEET REPORT: BUCKINGHAM
Ludwell Sibley

The Delaware Valley Antique Radio Club ended its 1994 season with an indoor-outdoor swapmeet at Buckingham, PA on Nov. 13. Aided by prominent advance publicity in the *Philadelphia Inquirer*, the event sold-out of sales spaces with 29 vendors and drew over 100 carloads of buyers. Visitors received a special "Show Special" issue of the club's monthly *Oscillator* as a recruiting and educational effort. As a fund-raiser, the club raffled off a donated radio (a 1936 American Bosch 640 table set), nicely restored by club members. Voting in the radio-display contest was set up as "people's choice" because, given

the variety of fine pieces in the exhibit, a committee would have been hard-pressed to judge fairly. Taking top honors was Dan Schwartzman's excellent 1954 "Red Star" radio from the Soviet Union. A fine Zenith tombstone farm radio displayed by Tony Moletierre in working condition - running from a six-volt battery - won second prize. The "never seen" Sony TR-55 transistor set was on display by a major collector who prefers a low profile.

Overall organization of the event was by Mike Koste. Bill Overbeck and Dave Abramson handled the equipment contest.

Upcoming Events

NJARC monthly meetings are always held on the *second Tuesday* of each month, at the Grace Lutheran Church in Freehold.

Directions to NJARC meetings.

From Route 9, take the Freehold Circle to Route 33 East (Park Avenue). Continue about 6 blocks to Route 537 (Main Street). The church is on the far right corner. From Route 18, take Route 537 (Colt's Neck Road) West through the center of town, 537 becomes Main Street, to Route 33 (Park Avenue).

For additional information about club events, phone or write to the appropriate contact person listed in the masthead on the inside front cover. The *Calendar of Events*, also on the inside front cover provides a handy reference for upcoming events in addition to our own meetings. Additional information about upcoming events in neighboring clubs can be obtained by contacting the appropriate contact persons from those clubs.

In February, in addition to NJARC events, the Delaware Valley Historic Radio Club will hold their regular monthly meeting on Tuesday, Feb. 14. The club meets at North Penn Amusements, 113 Main Street (Rte 113), Souderton, PA. For additional information about DVHRC, contact Mike Koste at 215.646-6488 or Ludwell Sibley at 908.782-4894.

The Central PA Radio Collectors Indoor Meet will be held on Feb. 25 in Williamsport, PA. *This date is still tentative at press time.* For current information, contact Frank Hagenbuch at 717.326-0932 or Mike Heffner at 717.546-2907.

March offerings include NJARC and DVHRC regular monthly meetings, as well as the PARS "Spring Fever" Event. For information, contact Bonnie Novak at 412.481-1563.

In May, the granddaddy of the clubs, the AWA hosts their Spring meet in Bloomfield, NY. Contact Lauren Peckham at 607.739-5443.

June brings MAARC's annual multi-day "Radioactivity" event. The meet is tentatively scheduled this year for June 9 & 10. Updated information can be obtained by calling Ed Lyon at 301.293-1773.



The planned merger of the Antique Radio Club of America with the Antique Wireless Association is pretty much a certainty. The on-site and proxy votes at the special member meeting on Dec. 1 (Charleston, WV) totaled 307 for, six against. The vote ratifies an ARCA board decision of last June, announced at the Little Rock national meet as pretty much a "done deal" and followed by the ARCA *Gazette's* publishing a "final edition" - all of which prejudged the member vote.

ARCA was founded in 1972 in response to a perceived need for a national *collectors'* group, as opposed to the wireless-operator and old-time "ham" emphasis of AWA at the time. In the early years it operated with a good deal of vigor. The quarterly *Gazette* often had lively articles from heavy-hitter authors. Pioneer radio inventor Harry Houck, now deceased, provided financial support at a couple of critical moments.

ARCA's philosophy on conducting its annual meet was to rotate the location, versus the fixed (Canandaigua) plan used by AWA. ARCA met at Cincinnati, Elgin, Louisville, Mystic, Valley Forge, and similar dispersed sites. While this had the claimed advantage of making the event more widely available, it also led to "churn" and inconsistent results - if a relatively vigorous local club like Mid-Atlantic ran the event for ARCA, the results were good; if not, the event suffered.

ARCA was visibly democratic, with direct election by the membership and openly announced election slates, as opposed to AWA's sealed-off process. Neither club was ever open about its finances, possibly due to a feeling of rivalry - MAARC, by contrast, publishes its figures scrupulously.

In any event, ARCA seems never to have exceeded 1000 members, versus AWA's slow growth to above 4000. Absorbing ARCA gives AWA the equivalent of two or three years' growth, considering the many individuals who are members of both clubs. ARCA members are being "kept whole" as to their dues by being credited toward AWA membership.

A certain number of rumors have been circulating this year about the combination. Contrary to one story, (Continued on page 19.)

A CANAL TELEGRAPH LINE

Tom McConkey, 6 Maple Ter., Verona, NJ 07044

Reprinted with permission from *Dots and Dashes*, quarterly publication of the Morse Telegraph Club, April 1994.

1994 was the 150th anniversary of the opening of telegraph service between Baltimore and Washington. Samuel Morse's electric telegraph may have been invented on a ship crossing the Atlantic, but it was developed into a workable system here in New Jersey, at Alfred Vail's Speedwell Iron Works in Morristown. Since wire communication led to "wireless" and thence to "radio," the bit of NJ history below is particularly poignant.

Ever hear of a canal telegraph? A real, functioning communication system devoted solely to canal operation? Such an enterprise did exist on the Delaware and Raritan Canal in the state of New Jersey for the greater part of half a century, and had the distinction of being the original route of the Morse Magnetic Telegraph, extending from Baltimore to New York, after the Washington-to-Baltimore line proved successful in 1844.

The D & R Canal opened for business in 1834 - ten years before Professor Morse's immortal words were sent thundering through the wires. Telegraph poles were erected along the canal bank, rather than along the right-of-way of the Camden & Amboy Railroad, which was shorter and more direct in distance, but not touching at Trenton, Princeton or New Brunswick, all prominent New Jersey centers of population. Trenton, the state's capitol, was an essential source of business for the newly invented telegraph.

Since communication by electric impulse is instantaneous in any direction, it made little difference which way the wires were strung. The can and railroad companies were of one and the same ownership as of February 15, 1831 and were commonly known as the "Joint Companies." Within five years of the start of the barge operation on the canal, the railroad laid tracks along the berm, on the opposite side of the canal towpath.

Fearful of what happened in Boston when people froze to death because of a lack of wood to burn for fuel, New York - an island - looked to anthracite coal to keep warm in winter and to fuel its fast-burgeoning industries. Trouble was, anthracite was mined in Pennsylvania and the cost of coastal shipping prohibited anything but small amounts of coal to move by this route. An inexpensive method of transport was needed to get this low-grade commodity to market. The answer lay in canals, the waterway system for crossing land with boats drawn by animal power.

The D & R canal was 44 miles long, with a 22-mile navigable feeder waterway to assure constant flow of water. What it lacked in length, it made up in breadth, measuring 75 feet wide and eight feet deep. Many canals of the period were not as wide, and had four-to-six foot drafts.

The canal was relatively level and crossed New Jersey, at its narrow waist, with only a 57-foot difference in elevation tidewater-to-tidewater, and consisted of eleven sets of locks. A well built canal, it collected tolls up until 1932 and closed as a result of the great Economic Depression, not because of functional inadequacy.

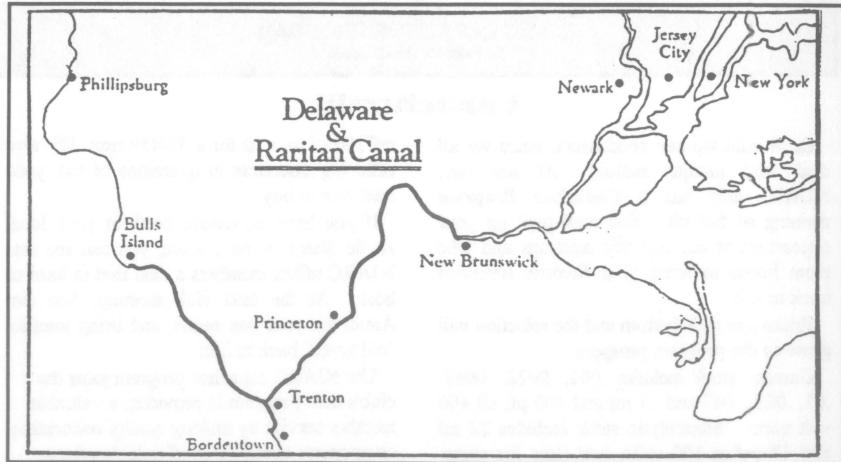
Ninety percent of D & R Canal revenue was derived from payments made by coal-barge owners or operators. Passenger travel was nil. With a railroad caressing the canal bank it took two hours by train, compared to two days by boat, to travel the same distance.

Unprecedented train travel at the height of the Civil War in 1864 forced the railroad to vacate the canal bank in favor of a better route. The "Joint Companies," owners of both railroad and canal, accomplished this by buying out the turnpike toll road that paralleled the D & R Canal in a straight line across New Jersey. At the same time it gave rise to the famous "Princeton Shuttle" connecting the university town with the new double-track main line (which eventually became Amtrak's "Northeast Corridor") 1.7 miles eastward of the canal, with the Princeton shuttle train still functioning 130 years later.

With the rails gone, the telegraph poles remained in place handling commercial business. The railroad stations at Princeton and Kingston were both served by spur lines. The Pennsylvania Railroad, not satisfied with Philadelphia as its eastern terminal, in 1871 stretched its tentacles northward to reach the Hudson River opposite New York City, by embracing the ancient Camden & Amboy Railroad, along with the D & R Canal.

(Continued on following page.)





The 44-mile long D&R Canal crossed New Jersey at its narrow waist and had a telegraph circuit from Bordentown, on the Delaware River, to the Raritan River port of New Brunswick, thence overland by way of Newark and Jersey City to the main office in New York.

PRR's acquisition of the two companies cast a pall over residents of the state, who felt their sovereignty had been invaded. In spite of traffic having already reached its zenith, operationallywise, better days lay ahead for the D & R Canal under Pennsylvania Railroad aegis.

To begin with, the main office was moved to 129 Broad Street, New York, a few doors down from the prestigious New York Stock Exchange. Also, the telegraph was installed as part of the railroad operating department at canal locations, and steam-powered tugs to haul barges were introduced to expedite movements. Unlike mules, tug boats could handle more than one barge at a time.

In a revised list of D & R Canal wire office calls, effective 12:01 A.M., May 17, 1891, the PRR shows each office with an asterisk (indicating "Daily Except Sunday" service) which, if nothing else, establishes that the canal was not open for traffic on Sundays. The only canal office open seven days a week was the off-line Canal Coal Port at South Amboy where an accumulation of anthracite was stockpiled during the months of the year when the D & R Canal was navigable, April to December. As winter wore on, the supply was depleted through sales to customers.

With New York as the main office, there doesn't appear to have been a system of dispatching boats through the waterway, such as that employed the railroad. However, restrictions were applied to tug boat operations, with the telegraph utilized to regulate the speed of these steam-powered craft not to exceed 4.5 m.p.h. to prevent

excessive lashing of water against the side walls of canal banks.

According to the PRR General Order of 1891, canal telegraph offices were established at the following locations, listed herewith in order from north to south, along with office identification signs:

MR Canal Director.....	New York, N.Y.
FI Canal Coal Port.....	South Amboy, N.J.
CB Canal Office	New Brunswick
DK Canal Office	New Brunswick
HN Canal & R.R. Offices	Millstone
VA Ten Mile Lock	Weston
VK Canal & R.R. Offices.....	Kingston
VO Canal Draw Bridge	Princeton
RP Canal & R.R. Office	Princeton
GV Canal Office	Trenton
DY Canal Office	Bordentown

Little information is available on how the canal telegraph functioned. In his book *Old Canals of New Jersey* (N. J. Geographical Press, Little Falls, NJ, 1963), Richard F. Veit devotes only one paragraph to the influence of the telegraph system of communication on canal operation:

A telegraph station, maintained on the bank of the canal in Kingston, connected this central point on the waterway with similar stations in Trenton, Princeton, Griggstown and New Brunswick. Conditions at the two major termini could be quickly determined by lock operators, while company officials could check on the progress of any particular barge through the canal. Station operators could also ascertain (Continued on page 18.)

NJARC CAPACITOR PROGRAM

New Member Benefit Debuts

Capacitors!!!

Or should we say condensers, since we all deal with antique radios? At any rate, NJARC now has a Capacitor Program running at full tilt. You may pick up your capacitors at our monthly meetings and take them home to bring your favorite treasures back to life.

Prices are rock bottom and the selection will grow as the program prospers.

Current stock includes .001, .0022, .0047, .01, .022, .047 and .1 mf and 100 pf, all 400 volt units. Electrolytic stock includes 22 mf and 47 mf at 160 volts, just right for resurrecting AC/DC sets, as well as 10 mf and 33 mf at 450 volts, perfect for most transformer-operated radios. Prices start at a low nickel for the 100 pf units to 30 cents for the .1 units. Electrolytics start at 55 cents for a 22

mf/160 v/ to 1.70 for a 33/450 unit. We also offer big discounts in quantities of ten, your best way to buy.

If you have purchased parts at your local Radio Shack or parts store, you can see that NJARC offers members a deal that is hard to beat. At the next club meeting, See Jim Amici for your cap needs, and bring another "old timer" back to life!

The NJARC capacitor program joins the club's tube program in providing a valuable member service by making quality restoration components available at affordable prices, and serving as an additional source of income to keep the club treasury healthy and ready to fund new club activities. Donations to our club programs of any good capacitors and tubes are always welcomed.

Silent Key

William E. Stokes, age 68

NJARC members will miss fellow collector Bill Stokes, who recently passed away. One of our most active and talented members, Bill served the club in many ways: by sharing his considerable expertise, and equally by frequently filling the less glamorous role of providing manpower at swap meets.

A retired advertising agency graphic artist, Bill served as a radio operator during World War II aboard the USS Curtis, but had no other contact with the electronics industry prior to his becoming active in the antique radio hobby relatively recently. Bill will be principally remembered by club members as a skilled machinist and restorationist who specialized in wireless-era gear and in fabricating authentic reproductions of rare pieces of equipment. Bill also regularly used his machining talents to fabricate restoration components for fellow collectors. Testimony to his meticulous craftsmanship was a first place award at AWA's Rochester conference two years ago for his reproduction of a wireless-era loose coupler receiver. This receiver, along with other items from Bill's collection were demonstrated at our meeting last January (reviewed in NJARC News Vol. 2 No. 2.)

MAY MEETING REVIEW

John Ruccolo

Friday, May 13, 1994: Jim Whartenby "Superheterodyne Receivers -- Theory and Practice"

May 13, 1994 Jim Whartenby presented the first of a two-part presentation on the superheterodyne receiver, certainly the most popular type of radio receiver design. (The bulk of the collectible radios made after the 1920's are "superhets.")

It had a good beat

Jim started his presentation with nicely detailed and drawn diagrams comparing various types of oscillator circuit design. The oscillator generates the "local" signal which is mixed with the incoming radio signal from the antenna. Jim then moved on to describing the mixer stage, where the combining of the oscillator and incoming radio signals produces both the sum of these signals (not used by the receiver) and the difference between them.

This "difference" signal is known as the intermediate frequency (IF) signal, which is then amplified by one or more IF amplifiers. As with the oscillator circuits, Jim compared the various mixer designs. Oscillator and mixer circuits are tricky; manufacturers had to compromise between circuit complexity, performance and price. The superhet was developed in the early '20's, but did not become the industry standard until the early '30's, when the circuits were perfected [and when RCA, under threat of an antitrust suit, decided to license other manufacturers to produce them - Ed.]

Early improvements

Jim moved through early mixer designs to the electron coupled mixer, which provides isolation between the oscillator and mixer stages - the oscillator remains stable, and greater tuning accuracy is assured. It should be pointed out that up to this point most oscillator and mixer designs were based on separate triode tubes.

Next, Jim covered the autodyne mixer, which combined the functions of the oscillator and mixer in a single tube. This development made possible the first of the inexpensive 5-tube sets of the '30s. The disadvantage of this design is that the gain cannot be controlled by an AVC (Automatic Volume Control, a.k.a., Automatic Gain Control) circuit (more on this later). The autodyne mixer has *some* gain, meaning that some amplification takes place - resulting in greater receiver sensitivity. The autodyne circuit

made use of the more modern tetrode or pentode tubes.

Five grids are better than one

Finally, Jim described the most advanced single-tube converter design, the pentagrid converter, which is used in most broadcast receivers after the mid 30's. Five grids (hence the name pentagrid) are used; popular types are the 6A8, 6K8, 12SA7, and 6BE6. A single stream of electrons is produced by the oscillator and modulated by the incoming signal from the antenna. The two screen grids within the pentagrid converter isolate the oscillator from the mixer, eliminating any undesirable interaction (however, the desirable effect of passing the electrons through to the mixer is accomplished).

A club member asked if pentagrid tubes are "touchy." Yes, they can because of their complexity. These tubes cannot be tested reliably in a tube tester (except for burned out filaments and, perhaps, shorts). Jim mentioned the simplest and best way to test pentagrid converters - put the tube in a radio and see how it performs, or substitute a tube of known quality. Jim mentioned that even if a tube is bad, he hardly ever throws it away (sounds familiar). "If anything, I can just put 'em on display," Jim said. Gee, I dunno, Jim, a display of pentagrid tubes doesn't sound that exciting, but hey! Whatever turns you on!

JULY MEETING REVIEW

John Ruccolo

Friday, July 8, 1994: Jim Whartenby "Superheterodyne Receivers -- Theory and Practice, Part II"

In the second part of his 2-part presentation on the Superheterodyne Receiver, Jim Whartenby covered the alignment of the IF stages. Once again, Jim provided well-prepared handouts.

Proper IF alignment means the difference between low sensitivity/"mushy" performance, and high sensitivity and sharp performance. With early IF transformers ("cans"), you adjust the capacitor that is in parallel with each side of the IF transformer to align. In later IFs the inductance was adjustable, and the capacitance was fixed. IF adjustment methods.

The simplest way is to adjust each transformer for maximum volume from the speaker. But the

(Continued on following page.)

JULY MEETING REVIEW

(continued from previous page)

ear is not a very sensitive indicator; the level must increase by 3 db in order for the change to be detected by the average ear.

Inexpensive tools to the rescue

A VOM can be used to measure output, but its impedance is low (it "loads" the circuit). A VTVM is a highimpedance instrument (about 100 times that of a VOM!). Best of all, you can use an oscilloscope, which has the same impedance as a VTVM, but gives more information (you can actually see the shape of the IF bandpass on the scope!).

Jim showed us his "freebie" signal generator (obtained at an NJARC meet) and his \$10 garage-sale oscilloscope. Both needed a little work, but they demonstrate that good hobby test equipment doesn't have to be expensive. Jim converted the RF generator to a sweep unit, which sweeps 5 kilohertz above and below the IF frequency to obtain the ideal bandpass for an AM broadcast set.

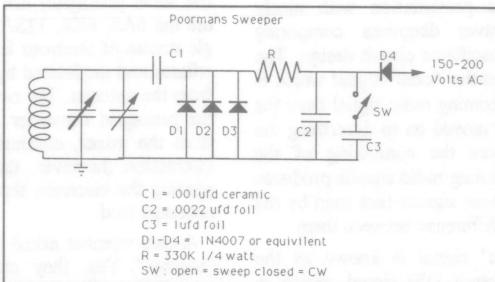
Jim explained the "quick and dirty" circuit that provides the sweep signal. (see diagram, figure 1) Jim used a Guild Country Belle AC/DC radio for the alignment demo; he plugged this into an isolation transformer for safety. The first step in the alignment process is to disable the local oscillator. The large section of the tuning capacitor is usually the oscillator section. This can be shorted out with a small screwdriver. The RF generator is then set to 455 kHz - exact calibration of the generator is possible by checking its second harmonic ($455 \times 2 = 910$ kHz) on a receiver of known accuracy. Jim put the RF generator into sweep mode and showed the IF response on the oscilloscope. Jim showed that by adjusting the IF transformers in the radio, the response would sharpen or broaden, depending on the direction of the adjustment. Typical IF transformer response is 10 kHz (plus or minus 5 kHz of the IF frequency). It's advisable to do the alignment with the volume control at maximum. This requires less drive from the RF generator; this minimizes the effect of the AVC circuit that most modern superhets have. Jim injects the RF signal on the first grid of the pentagrid converter stage. Also, it's advisable to start

with the last IF transformer first, and work backwards toward the antenna.

The radio was demonstrably more sensitive and had better fidelity after the alignment. The 10 kHz band-width is high-fidelity by AM radio standards. If the bandwidth is narrowed, the audio quality is sacrificed. If it's widened, adjacent stations and noise begin to interfere. Jim mentioned that a good topic for

future discussions would be "tracking,"

keeping the IF frequency at a constant 455 kHz. This results in accurate tuning across the entire AM band. In practice, accurate tuning is obtained on only



C1 = .001ufd ceramic
C2 = .0022 ufd foil
C3 = 1ufd foil
D1-D4 = IN4007 or equivalent
R = 330K 1/4 watt
SW: open = sweep closed = CW

2 or 3 points on the dial. The rest of the dial markings are just good approximations. This is typical design of consumer broadcast receivers. More elaborate (and expensive!) receivers, including the for military, commercial or ham-radio work, tune much more accurately. Once again, radio manufacturers had to compromise between cost and performance. Jim should be congratulated for a fine demonstration; he's not afraid to tackle a tough subject. Hey Jim, how 'bout aligning an R-390 next time?

AUGUST MEETING REVIEW

John Ruccolo

Friday, August 12, 1994: Al Klase "Electronic Restoration Techniques"

"What's the most magical thing about old radios?" asked Al Klase, to kick off his presentation at our August meeting.

"Memories" was his answer - "and they play". These old radios can pull stuff in from around the world. Vintage receivers, frequently over half a century old make great display pieces, but Al urged the audience to fix them up and make them work like they were new. With some of the techniques he would demonstrate, he suggested that we should easily be able to keep most of these great old sets playing well into the next century.

The presentation offered fine coverage of covering general radio restoration topics. Al's background is in (Continued on following page.)

engineering, and he's been collecting about 12 years. He was well prepared and offered an enthusiastic "show" for those assembled.

Your Most Important Restoration Tool: The Shotgun

What's the best way to keep 'em playing? Al concentrates on capacitors, the single most common cause of failure in the old sets. He recommended a "shotgun" approach, replacing most (if not all) capacitors, and certain resistors. Modern parts hidden below the chassis are perfectly acceptable to Al's way of thinking. This is, of course, a matter of personal opinion, but Al doesn't recommend wasting a lot of time pulling the guts out of old capacitors and inserting smaller modern components inside the old shell, unless you're a real purist. Just replace the entire capacitor. [Of course, you can save the old ones, just in case an attack of radio Puritanism strikes you in the future. Ed.] During the golden age of radio (1930s and 40s), the higher component count of the more elaborate sets meant lower reliability - not nearly as much was known about material science as today. Most resistors and capacitors were not made to last more than a decade. Compare these radios to an earlier model - Al used the 1927 Atwater Kent model 30 as an example. It has only a grid leak resistor and two paper capacitors! Al's 1938 Zenith 12-tube Walton set has many times that number of parts. It's not worth replacing just the one or two worst capacitors in the set just to get it going. In a short time other caps will fail, if the set is used regularly. Might as well replace them all up front, especially an elaborate and valuable set like the Zenith Walton.

Visual Inspection and Testing

The first step in the restoration is visual inspection. Look for irreparable cosmetic problems like broken dial glass, heavy modifications, (a common problem with ham or communications gear). Inside look for caps leaking wax, burned resistors, etc. Pay particular attention to the condition of the power transformer. It's the most expensive part, and the most difficult to replace. We'd like to know the transformer is good before we begin a serious rest-oration. A good way to protect the power transformer is to install a fuse inside the chassis - usually a one or two amp is sufficient.

For the first test, pull the rectifier tube. This eliminates the load on the high voltage windings, and keeps voltage off the old, leaky (and possibly shorted!) filter capacitors.

Measure the high voltage with the rectifier tube removed. Both sides of the winding should be equal.

Al digressed briefly into cleaning - he highly recommends Gojo waterless hand cleaner, available at most auto parts stores. A similar product goes by the brand name Goop. Lubrication - grease tuning capacitor bearings, use light oil on dial cord pulleys, and TV tuner cleaner on bandswitches and volume controls.

Now back to the electronics - get all of the old electrolytic capacitors out of there! Don't parallel new capacitors with the old ones; remove them completely. You can leave the chassis mounted caps in place for appearance sake (so you don't have big holes in the chassis).

Don't "Improve" the Circuit

Al described the typical 1930's or 40's power supply, with a 5-volt rectifier tube like the 80, 5Y3, etc. Don't replace low-capacity units (like 8 or 16 microfarads) with 47 microfarad caps; try to get close to the original value. The larger capacitors will raise the power supply voltage considerably; this could disrupt some circuits and stress some components. Also, if modern silicon diodes have been installed in place of the rectifier tube, remove these also. They're too efficient as rectifiers and, once again, set voltages will be much higher than necessary. Tubes like 80 and 5Y3 are still easy and cheap to obtain, [and much more interesting to watch than a pair of silicon diodes -Ed.]

Paper capacitors are the real "bad guys" in old radios. Usually, these are coated with beeswax. Modern capacitors have plastic dielectric insulation, as opposed to the oil-treated paper of the beeswax-coated caps. The small, low-value mica caps (often color-coded) rarely go bad. Don't bother replacing these, or any cap in a tuned circuit, unless absolutely necessary. Replace with quality caps like Sprague Orange Drops or Vitamin Q's. Unfortunately, Vitamin Q's are difficult and expensive to find; do some digging at the radio meets and hamfests. Modern capacitors are hundreds of times more reliable than the old stuff. Replace all audio coupling and bypass caps, and especially the AVC filter cap. If the AVC cap is leaky, the AVC action of the radio is compromised, and distorted audio is usually the result. This is one of those subtle problems that's difficult for the beginning restorer to track

(Continued on following page.)

AUGUST MEETING REVIEW (continued from preceding page)

down, so take Al's advice!

A Neat Little Timesaving Trick

Al presented his method for making the tedious process of replacing all those capacitors easier. Sprague used to provide little wire "spirals" coated with solder, which were used to speed replacement. Simply cut out the old cap, push the end of the lead into the spiral connector along with the lead of the new cap, and solder. Do this one cap at a time so you don't mis-wire anything. Al demonstrated how to make the spirals by using a machinists tool called a pin vise, in which a 1/32" drill bit is clamped backward, giving a nice pin on which to wind your own spiral connectors (using No. 22 or 24 tinned wire). This process reduces the time required to re-cap a big 12-tube set (say, 20 or 30 caps) to about an hour! The time-consuming desoldering of old caps has been eliminated. Resistors are much less troublesome than capacitors, although problems are still common. The values of resistors tend to rise over time; if a 470 Kilohm resistor measures 1.5 Megohm, get it out of there. Most resistors in older sets were 10 or 20 percent tolerance; they can be pretty far from their marked value and still not disrupt anything. A 100 Kilohm resistor measuring 120 Kilohms is OK; if it measures more than about 150 Kilohms, replace it. Pull all the tubes out, test them and clean them, but don't rub the numbers off! Replace things like worn dial cords and AC line cords now, if they appear to be deteriorating. Al's final point was a very good one: Resist the temptation to align the set until after all suspect parts have been replaced - remember the old mechanics' axiom: "You can't tune junk." What's the payoff? The radio plays!!! Nice work, Al!

SEPTEMBER MEETING REVIEW John Ruccolo

*Friday, September 9, 1994: Jim Whartenby
"Test Equipment"*

On September 9, 1994, Jim Whartenby followed his excellent two-part talk on the superheterodyne with a presentation on test equipment. The first part of the talk concerned the difference between a VOM (Volt-Ohm Milliammeter) and a VTVM (Vacuum-Tube Voltmeter). Jim created an experiment to demonstrate the difference. Five voltage divider resistors were connected across a 12v power source. From left to right, the resistance goes up by a factor of 10. The

SEPTEMBER MEETING REVIEW (continued)

difference in performance between the two becomes apparent in high-impedance circuits. As Jim measured the higher impedance circuits, the VOM becomes part of the circuit (it draws an appreciable amount of current). The VOM changes the voltage-divider ratio; this distorts the measurements. The test VOM was a 100 K Ω -per-volt Simpson.

Next, Jim demonstrated the VTVM. The VTVM, with its extremely high impedance, doesn't significantly affect the circuit under test, and much more accurate readings were obtained. Jim did the math in advance, to verify the results of the experiment. Next, Jim used a modern digital voltmeter, which wasn't quite as accurate as the VTVM(!), although it was close.

I Always Wondered What That Meant!

Next, Jim explained what the ohms-per-volt rating of a VOM actually means. To get the ohms-per-volt rating for a given range on a VOM, multiply the specified rating (for example 100,000 ohms-per-volt) times the full-scale reading for that range. For example, a 100 K Ω /volt meter on its 100 volt range would have an impedance of 10 megohms. On the higher voltage ranges (100 volts or more), a good VOM approaches the accuracy of a VTVM. The big problem for the VOM is the low voltage ranges. The AVC and oscillator grid circuit measurements can be disrupted by a VOM since these are low-voltage, high-impedance circuits.

Jim then covered one of my favorite pieces of test equipment, the Grid Dip Oscillator (GDO). Basically, this is an oscillator with a meter in the circuit that measures grid current. If the GDO's exposed coil is brought near a tuned circuit, that circuit will draw energy from the GDO, causing the grid current to dip (hence the name Grid Dip Oscillator). The GDO can be used as a signal generator for "rough" alignment of transmitters or receivers, but it's not as accurate as a full-size RF generator. The GDO is commonly used to determine the resonant frequency of a tuned circuit. Jim brought the GDO close to the circuit, and tuned the GDO until a pronounced dip was seen on the meter - when the resonant frequency was reached. In this case, the demo circuit tuned from about 12 to 30 MHz.

Thanks again, Jim for enlightening us! Next time you see a VTVM or GDO or RF generator or whatever at a radio meet, maybe you'll have some use for it. Ironically, test equipment is usually the cheapest stuff at radio meets!

NJARC HIGHTSTOWN AUCTION, 11-5-94

E - excellent; VG - very good; F - fair; P - poor; NT - no tubes; WT - with tubes; N. I. B. - new in box; book - original manual; C. O. B. - xerocopy of book

AUDIO GEAR

Fisher Ambassador tuner & amp., G	10
Heathkit small '60s stereo amp, VG	6
JVC stereo cassette deck, VG	16
Kenwood stereo receiver, VG	11
Lafayette 2N189 PA amp, VG	7
Sansui stereo receiver, VG	10
H. H. Scott 330 AM-FM tuner, G	20
Victrola, portable, w/ scarce No. 4 reproducer, F	10

BOOKS

CQ Command Sets (1957), E; CQ Radio Amateur's Mobile Handbook (1953); Radio Broadcast, June 1925, F; GE Essential Characteristics tube manual, G	13
Hammarlund Short Wave Manual, 2nd. ed.; Ultra Short Wave Amateur Band Communication (Millen, 1932); VG	15
Radio Amateur's Handbook, ARRL, 1933 and 1935 (worn and loose but intact)	40
Radio Amateur's Handbook, ARRL, 1943-68 (8)	28
Radio Handbook, 1937-56 (5)	18
Radiotron Designer's Handbook, 4th ed., G	35
Rider's Vol. 9 and xerocopied 1947 index	10
Rider's Vols. 10-12, VG	12
Rider's Vols. 13-14, VG	6
SOS to the Rescue, Coast Guard to the Rescue, A Night to Remember, On the Bottom; G	10
Tech manuals, AN/ART-13 transmitter, LM-15 freq. meter, E	15
Tech manuals, LM-18 freq. meter, SCR-522A transceiver, G	5
Television, Vol. 4 (RCA Review, 1942-46), Terman, Radio Engineering, 1947; Rider, Vacuum Tube Volt Meters; Bucher, Vacuum Tubes in Wireless Comm., 1919 (F); Allied catalog supps. ca. 1948 (4); IRE Yearbooks 27, 31, 32, 37, etc.	30
The Manual of Short Wave Radio, Vol. II (Bouck); Hammarlund Short Wave Manual, 6th ed., G	23
The Story of the First Transatlantic Short Wave Message, R. C. of A. Proceedings, 1950, VG	23

CATALOGS & LITERATURE

Catalogs, ca. 1946-47; National, Hallicrafters, Stancor Hammanuals, B & W, Hammarlund, Taylor Tubes, etc.	20
Catalogs/tube manuals: RCA TT-3, Eimac, RCA subst. guide, RCA Guide for Transmitting Tubes, etc.	13
Literature, communications: 1950s-'60s service data - Webster, Motorola, GE Prog Line, Polytronics, Dumont	13
Hallicrafters catalog, 1945; Johnson Viking catalog, 1962; FCC Commercial Op. Ref. Manual & Study Guide, 1939; Wire & Radio Comm., Feb. 1960; FCC Rules, Part 2, 1939; 101 Radio Hookups, 1930 (F-G cond); Meissner "How to Build" Manual, 1943; Radio Direction Finding & Beacon Service, Navy, 1945	45
Instruction books for RCA CRM-P2A-5B rig, RCP 663 multimeter, Hickok 610A sweeper, Altec 306A AM-FM tuner, Altec 353A amp, and 800 recorder	23
Manual for RCA ACR-155; FCC Study Guide and Ref. Material for Comm. Radio Op. Exams, 1943; Sams Handbook of Ham Radio Circuits (1963); SOWP Wireless Register, 1992; SOWP Yearbook - Dir. of Amateur Calls, 1976, VG	10
Philco service notes, 1928-38 and 1946-50; 1939-40 Yearbooks; 1949-53 TV	33
Radio service notes - United Motors 1934-41; Cadiac, 1940-42; Philco Transistone, 1935-38; Westinghouse, 1940; Crosley, 1940; Fada, 30s; Emerson, mid-30s	15
Literature, TV service, 1947-53; Motorola, Admiral, Dumont, Sylvania, Capheight, Crosley, Televideo, Sparton, and S-C	10
Papers: 1920s receiver designs by Westinghouse w/ photos; disc TV papers (Beers)	10
Papers: exp. TV set papers; '20s superhet design w/ photos; misc. RCA papers; 1931 hi-fi receiver design (Beers)	50
Papers: Misc. papers and photos; 1931 patent application; IRE superhet paper (Beers)	10
Papers: Power detectors, scanning-disc TV photos; '30 RCA personnel directory; '20s patent applications	20
Papers: RCA perf. tests on Radiola 28A, 50; detector analysis; 4-tube exp. midget set with photos, dynatron osc.; tuning inds.; draft and final 1929 Beers IRE papers on superhet	23
Photofacts, Nos. 1-25 (orig. 1946-47 printing) and 50 later	13
Slides, ten 3" x 4" glass, of RCA color-TV dev. ca. 1955 (Beers)	33

COMMUNICATIONS EQUIPMENT

Amateur-station accessories: Micromat SWR meter; RCA AC mon., Heath AM-1 and HD-1422-A ant. meters; B & W coax switch; Johnson low-pass filt.; Heath Q-mult.; Hallicrafters speaker; Dow-Key preamp; all G-VG	90
Hallicrafters HT-30 exciter, no power xfrm or tubes, VG otherwise, book	30
Hallicrafters S-22 Skyrider Marine, F	33
Hammarlund SP-400SX Super Pro, w/orig. cabinet, power supply, speaker cabinet, book, fine cond.	160
Home-built transmitter, in case from TU-9, G	10
Link 11-UF prewar mobile receiver, matching speaker, G	5
Link 35-UFM prewar mobile transmitter, book, G	5
Millen 90800 exciter, VG, orig. box, 5' spare coils, book	110
Temp 1 SSB transceiver, orig. box, w/ Heath HW-23 power unit, G, books	120
WRL LA-1 linear amp, some mods., book, G	70

GENERAL

Atwater Kent TA amp. unit, socket-&-rheo unit, & variometer	70
Audio xfrms., '20s: Radiola III, All-American, Samson, Mignon, RCA UV-712, WECO, Pilot, Harkness, etc.	48
Battery cables, '20s radios, at least four G	20
Bulbs and fuses, big box lot	20
Capacitors, fixed, lot of '20s micas	33
Coils: Pacent honeycomb; National MB-40-SL; Branston duo-lateral; Pilot plug-in (2); B & W 80HDVL w/ jackbar, etc.	10
Condensers, tuning, large box of '20s	20
Crystal detector, Freshman adjustable, and W. S. A. spark "kickback protector"	30
Crystals, quartz, box lot, incl. amateur	7
GE Tungar battery charger, with tube, G	5
Headsets, parts, and cords, large box lot	30
Knobs and dial escutcheons, box of '20s	13
Knobs, box, mainly '20s	25
Madison-Moore '20 RF xfrms (5)	20
Magnet wire, box, incl. some silk- and cotton-covered	7
National PW dial, E	18
Philco Socket Power AB batt. elim., less recta. and batts., G	10
RCA AP-937 Duo-Rectron batt. elim., less UV-213 tube, VG	20
Rotator, Alliance, w/ controller	13
Sterling "B" elim., WT, G	10
Transistors, "antique," from 6 vanished makers, box	12

NJARC HIGHTSTOWN AUCTION, 11-5-94

GENERAL (continued)

Transistors, lot, incl. CK-722	6
Tube sockets, four xmtg. '20s rcvg.	25
UTC S-48 plate xmtg.	15

KEYS AND MICROPHONES

Astatic D-104 mic, VG	20
Headset/mic, from B19 Mk II tank set; also T-17 mic, G	7
Keys - SigC J-36, G; homemade aluminum, nice	50
Keys - SigC J-38, E; Bunnell, knob non-orig.; Mesco, no knob	10
Mics, Argonne M131 w/ desk stand; mil. RS-38A; two WE candlestick xmtrs	15
Sounder, 20-ohm alum.-bar type, in unbashed resonator, VG	20

MAGAZINES

73, 1961-73 (150)	5
C-D Capacitor, 6" stack, 1940-61	5
CQ, Dec. 1945 (rare!) - 1975, ca. 100	20
Electronics Illustrated, 1958-70 (55)	5
Electronics, mid-30s, VG (3 lots of 7)	5, 7, 9
Elementary Electronics, 1965-69 (13); 11 1957-70 booklets (<i>Electronics Handbook, etc.</i>)	7
GE Ham News, 50s-60s, big stack	23
Ham Radio, 1969-73 (42)	11
Information Bulletin (Navy), 1944-51 (31); <i>The Radio Officers' News</i> , 1950-51 (12)	5
Popular Electronics, 1954-69 (156)	5
Popular Electronics, 1957-63 (36); <i>Electronics Illustrated</i> (7)	5
Radio & Television News, 1949-62 (110)	9
Radio Broadcast, 1928-30, VG, 2 lots of 5	18, 18
Radio Engineering, 1929-33 (3 lots of 5 or 6)	15, 15, 18
Radio Industries, 1929-32 (2 lots of 8 and 9)	10, 10
Radio News and Radio & TV News, 1931-49 (55), G	28
Radio, 1934-35 (12)	18
Radio, 1936-41 (29)	48
Radio-Craft and Radio-Electronics, 1942-51 (55), G	20
Radio-Electronics, 51-64 (79)	7
Radio-TV Experimenter, '57-'59 (17)	5
RCA Ham Tips, '40s-60s, big stack	13
Short Wave Craft, 1930-35 (8)	7
The Scanner, RCA "confidential" 1936-39, E (2 lots of 15)	60, 65

MILITARY EQUIPMENT

AN/ARC-3 antenna relay box, VG	5
BC-221A frequency meter, VG, book	8
BC-306 antenna tuner, VG	6
BC-453B receiver, gently converted, G	6
BC-474 (SCR-288) transceiver, VG, book	65
BC-645 (SCR-515) IFF transponder, new-in-box, E	10
BC-791 ink recorder (McElroy RRD-900-42)	10
MC-310A paper-tape puller (McElroy G1/CTP-1300), VG	5
MS-116A SigC antenna sections, (8), new	11
MT-101/ARC-4 transceiver mounting (2)	5
R-26/ARC-5 receiver, less tubes and adapter, G	15
R-274A/URK (Hammarlund SP-600), VG, C. O. B.	210
RBO Scott Navy "morale receiver", VG, C. O. B.	90

RECEIVERS, GENERAL

Acme E3 batt. elim., WT, G (two)	6, 13
Atwater Kent 10C breadboard, VG, tags, batt. cord VG, G tubes	850
Atwater Kent 20C restoration kit: two cases and parts	23
Atwater Kent 40, all "S"-bulb tubes, needs touchup on front	13
Colonial portable	30
Columbus 360 LP/78-RPM player, G	5
Crescent 45-RPM changer (RCA mech.), G	10
Crosley late-'30s auto radio, VG	20
De Wald A605 table radio-phonos, F-G	20
Dictograph Power 6 AC set, no tubes; F-G	45
Electronic Labz 2701 wood AC-DC, F-G	5
Emerson 334, E	5
Emerson AC149 bakelite, crack	5
Emerson tiny AC-DC, F	0
Eveready AC TRF chassis, no tubes, G	5
Freshman Masterpiece, table cabinet, internal horn, VG, less tubes	85
GE A-63 tombstone, G	20
General Ind. disc record-playback unit, home-built cabinet, G	11
Greene "A" trinkle charger, rough shape	5
Griffith TRF cathedral, poor but restorable	45
Hallicrafters World-Wide portable, G	35
Horne-built one-tuber, G	20
McMurdo Silver Masterpiece II tuner chassis, chrome G	90
Motorola 76T1 transistor portable	7
Music Master rotating loop, G	180
Nordmende Luxus, C, VG	35
Philco 30s wood AC-DC mantel set, F	11
Philco 42-340 wood AM/SW, G	8
Philco 89 cathedral, F	20
Philco D655 portable, G	5
RCA Radiola VIIIB (AR-907) regen. panel set, less tubes, G	375
RCA Victor 9K3 "Magic Brain" console, G	15
RCA Victor 16X13 table radio	25
RCA Victor 45J2 45-RPM record changer, G	9
RCA Victor 56X5 wood AM-SW, F-G	6
Sparton AC-62, w/ 5 Cardon and Kellogg AC tubes, G	160

NJARC HIGHTSTOWN AUCTION, 11-5-94

RECEIVERS, GENERAL (continued)

Sparton AC-62, as above, less power unit.....	50
Stewart-Warner 03-5EI AC-DC, F.....	5
Stromberg-Carlson 320-H table set.....	25
Stromberg-Carlson 501A, less meter and tubes; zinc rot.....	10
Thompson S-90 neutrodyne, rough, with batt. box.....	45
USL Broadcast Receptor, two-dialer, NT; needs refin.....	25
Webster-Chicago 1801 wire recorder, VG.....	11
Wilcox-Gay phono/disc-recorder/radio 9G-10 Recordio, F-G.....	23
Zenith 5D027, G.....	20
Zenith 7H918 bakelite AC-DC FM, G.....	11
Zenith shutter-dial console chassis, G.....	15
Zenith Transoceanic, '50s, G.....	53
Zenith Transoceanic, H500, VG, book, orig. Zenith battery.....	35
Zenith Transoceanic, L600, F.....	20

SPEAKERS

Amplion AR111 horn, nickel base, driver tests OK.....	230
Philco F10 case, no driver, exc. cloth and finish.....	30
Western Electric 540AW cone, tests open, needs reconnig.....	20

TEST GEAR

B & K 600 tube tester, F-G.....	10
B & K A107 TV analyzer, G.....	5
Coastwise Elect. 721 test speaker, discolored.....	7
Eico 377 audio gen, book, VG.....	23
Eico 460 oscilloscope, book, VG.....	20
Eico 625 tube tester, book, G.....	15
General Radio 783A audio power meter.....	16
General Radio 1612A2 cap. meter.....	13
Heathkit GD-1 grid-dipper, reg. & LF coils, book.....	5
Heathkit IT-12 signal tracer, book, E.....	5
Hickok 246 color bar gen, E.....	13
Milen 90600 wavemeter set, orig. box, E.....	13
PACO C-20 R-C bridge, book, VG.....	5
PACO T-60 tube tester, book, VG.....	33
Philco multimeter, 1940-42, VG.....	10
Precision App. 612 tube/batt. tester, VG.....	8
Precision App. Co. 912 tube tester, G.....	5
Simpson 260 VOM, carrying case, VG.....	15
Simpson 260 VOM, in carrying case, in box, w/ 655 microvolt attenuator and "parts" 260.....	28
Solar CE cap. tester, VG.....	7
Sterling '20s tube tester, G.....	10
Variac box, metered, home-built.....	8
* Variac, 3-amp, in case.....	8
Watt-hour meter calibrator, power co., G.....	9
Westinghouse meter, 0-5 volts (for Radiola 20?) , VG, two lots.....	8, 12
Weston 660 VOM, in box, VG.....	5

TUBES

45s, two Philic "S"-bulb, tested G.....	20
211s, two RCA, alum. bases, fil. G, sockets.....	33
CRTs, 2AP1 & 2-3BPI.....	7
VT-21, De Forest WW I vintage, fil. G.....	55
Western Electric 205D, fil. G.....	75
Lot, "modern", many N. I. B; incl. three 6146Bs.....	25
Lot, 12 big-pin, weak, incl. collectible cartons.....	30
Lot, 12 S-bulb - 24s, 26s, etc., hrs. G.....	28
Lot, 31 big-pin ST-bulb - 32, 42s, 80, etc., good emission, plus 3 bright 1629s.....	60
Lot, 69 big-pin - 24A thru 6A7, etc., hrs. G.....	75
Lot, 7 display-dude mostly brass-tipped - WD-11, UV-199, UX-199, blue 138, etc.....	42
Lot, big-pin "ST" - 01A, 10, 22, 24, 46, 47, 71A, 81s, 120 - 20 total, good emission; plus Hytron HY-871.....	180
Lot, S-bulb 45s (2), 6B4G, 6L6s (4), good emission.....	35
Lot, transmitting, 3 Einac 4-400As; 811A, 813, 814: fil. G; appear new.....	90
Lot, brass tipped UV-199s (2), bakelite UX-199 and UX-120; UV-886s (2); blue 24, 2A3s (2), fil. G.....	55
Lot, UX-216B and UX-250, S-bulb, good emission.....	45
Lot, Western Electric, WW I era - CW-1344 in socket, VT-1, VT-2; fil. G.....	150
Lot, Western Electric; 211E, open; 384A; 387As (4); 416B; 417A; 717A; 316As (2) (GE-made, N. I. B).....	30
Lots, two, ca. 1.5 cu. ft. octals each, hrs. G.....	23, 25

TELEVISION

Andrea 10" radio-TV, VK12 chassis, poor, needs CRT.....	5
Blonder-Tongue TVC-1 camera, w/ ALC light compensator, E.....	13
Blonder-Tongue TVC-1 camera, w/ TVC-1CC control and ALC light compensator, book, E.....	23
Delco TV71A 7", G.....	75
GE 10", bakelite case broken.....	35
Hallcrafters 7", G.....	80
Motorola TS-45 7".....	35
RCA KCS21 7" chassis, tunes Channel 1, clean.....	85
RCA Victor 13" bakelite, KCS61 chassis, VG.....	5
RCA Victor 721TS 10", VG.....	70
RCA Victor 8-T-241 10", F.....	20
RCA Victor 8-T-241 10", VG.....	38
Sony "Micro TV" 4", dirty.....	15

REARVIEW MIRROR

"A Glance Backward Through Time"

DIATHERMY SEEN AS WAR DANGER

Sylvania News, July 1942

Registration with the FCC of all diathermy apparatus in the United States was scheduled for completion on June 8. As the deadline approached, registrations in the New York City area alone numbered more than 10,000, and it was believed the final count might approach 75,000. Twenty-two other field registration offices were set up to cover the country from Alaska to Key West, Florida.

The reason for this requirement, as any radio man might guess, is that these machines generate radio-frequency energy and become, in operation, actual short-wave transmitters. For this reason, the Office of Emergency Management deemed it necessary that the government have complete data on all diathermy equipment and its owners and operators.

The usual diathermy machine is a large affair, usually found in hospitals or clinics. The danger, as the government sees it, is not in this apparatus, openly used in view of the public. It lies in the small machines for home or medical-office use, which can be concealed in a suitcase and readily moved from place to place. Such small machines have been known to transmit radio interference over hundreds of miles of land and water. Equipped with special devices, they might carry across an ocean. The rule therefore included registration of any machine capable of radiating a signal, whether it employs a radio tube, vibrator, or spark coil.

EFFECT ON RADIO

Aside from its importance as a war measure, this new government interest in diathermy radiation is of great importance in the field of radio, particularly in the ultra short-wave field now being developed.

As pointed out by Dr. Alfred N. Goldsmith, streaks flickering across the screen of a television receiver are frequently caused by diathermy - perhaps in the next block, possibly many miles away. Diathermy, says Dr. Goldsmith, should in future be supervised, as to installation and electrical operation, by radio men, to control this type of interference. All diathermy apparatus should be used in small rooms screened with copper mesh, such as are used in radio factories to test sets and tubes before marketing.

This is of course, a development that came only after the war, when such materials as copper are again available for commercial use. Meanwhile, the possibilities are something for servicemen to consider for the future.

[A German national whose daughter I know had one of these home diathermy sets when he lived in Newark. It gave perhaps 100 watts from a pair of 8005 tubes, with plates fed from unrectified AC. After the set was registered, the FBI came around and took it into custody. It was returned at the end of the war, and continued in household use to relax sore muscles, etc. After they moved to Long Valley, it stayed in use, even though the neighbors knew, from the obtrusive bar patterns in their TV pictures, when it was in use.]

The Dr. Goldsmith quoted above was, at the time, editor of the *Proceedings of the Institute of Radio Engineers*. His views became fact: after the war the FCC established rules covering the noxious radiations from diathermy machines and industrial RF heaters. Termed "industrial, scientific, and medical equipment," they now have frequencies allocated to them at frequencies (in MHz) of 6.78, 13.56, 27.12, 40.68, 915, 2450, 5800, 24,125, 61,250, 122,500, and 245,000. The radiation level from them is tightly controlled. The microwave oven in your kitchen, today's "home diathermy," probably operates at 2450 MHz. At this frequency, the chances of its signal reaching across the Atlantic are slight . . . - LAS]

NOVEMBER MEETING REVIEW

John Ruccolo

Friday, November 11, 1994: Mark Mittleman "Battery Receiver Restoring and Collecting"

On November 11, 1994, Mark Mittleman gave two presentations. The first was on ideas for shelving in your "radio room," and the second on front-panel restoration on 1920s sets; sets from this era are Mark's specialty.

Radio Shelving Hints

For the money, sturdy shelf brackets are the best investment. Mark located all the studs in the room and attached four foot brackets before moving any furniture in. Mark used wood shelves made from 3/4 inch marine plywood. This is less likely to warp than pine or mahogany boards.

The shelves are 1 foot deep and are stained, and also have an iron-on edging on the front. There are two types of shelf brackets - standard and heavy duty. If you have heavy radios, use the heavy duty brackets! These have a "wing" built in that keeps the shelf from wobbling. Mark measured the height and depth of each radio to set the various shelf heights. Most shelves are 36" long, but some are as long as 5 feet. Mark put shelves from floor to ceiling in some areas. Mark cautioned that no room is square - run a plumb 1 inch above the molding to square the shelves. Mark says that "once you run out of space, you're almost done." Mark also built one rack shelf with attractive spindles "to please mama." During the presentation, Mark showed slides of his radio room. Very impressive!

Front Panel Restoration Hints

Mark then moved on to the front panel restoration. Mark described the restoration of a 1924 Sherman radio, a 3-dial TRF. Although the radio was very rough as found, the original paperwork inside the lid was in mint condition. Mark took before and after pictures of the front panel, the cabinet, and the chassis. Remove the front panel for restoration. Small holes can be "filled" with countersunk screws. To find the original color of the panel, check the inside - most are black (some were originally brown), but the black panels will turn brown after decades of moisture in a barn or basement. Holes can also be filled with countersunk screws, and then covered over with car body filler.

Mark scrubbed the panel thoroughly, then used grease remover to take off fingerprints. Also, dirt and the remains of the original etched lettering were removed with a scribe. Use lacquer paint from a can. You can't wet-

sand enamel paint, and if you try, it will come out very bumpy. Spray on the enamel very thick. Don't worry about the etched lettering, the lacquer will be drawn around it as it dries; you'll be able to fill in the etchings later. The best thing about lacquer is that it dries very fast. Keep the dust off the panel while spraying. It takes about 20 minutes for lacquer to dry to the touch; but it's best to wait overnight before working on the panel. Three finishes were common on 20's sets - gloss, semi-gloss and a satin "sandy" finish.

Wet-sand the finish under running water with 600-grit sandpaper. Use a china marker, lacquer stick, or pastel stick to fill in the etchings. Wipe off the excess with a clean cloth. If you want a satin finish, use a polishing compound and clean cloth, and then a final polish to give it the grainy Clapp-Eastham look. For a semi-gloss finish, polish the panel (no compound). This is what Mark did with the Sherman radio. If a glossy panel is desired, compound it, polish it, then use wax for a super shiny finish like the Federal sets. The cabinet and chassis restoration of the Sherman will be covered at a future meeting. Mark brought the restored set along, and it was absolutely beautiful. Great job, Mark!

THE PRESIDENT'S BROADCAST

(continued from page 3.)

attended), printing and mailing our newsletter costs money, and little incidental expenses add up quickly, not to mention the cost of my recent fact-finding mission on antique radio collecting in the Bahamas... just kidding!

The bottom line on all of this is that we're a very healthy organization, in terms of number of members, continued growth, and financial security. We all owe each other thanks for working together to make this club the success it is today. Thank you to each and every one of you who has supported the club so well in the past. I'm looking forward to a great 1995 with you.

Happy Collecting!



LETTER FROM THE EDITOR

(continued from page 3.)

We all owe a debt of thanks to **Marv Beeferman** for putting together the Holiday Party for our December meeting. With his solid-state Santa hat and "*Oy to the World*" sweatshirt, Marv covered all the bases to provide those in attendance with a tasty and enjoyable evening.

Phil Vourtsis continues to video tape our meeting presentations. These tapes form the basis of our new club video library. This collection of videos will document all the useful information and other neat stuff presented to the club. In this way, members can review repair techniques or information presented at the meetings, and new members can benefit from presentations which were made before they came on board. (Of course we don't actually have any finished tapes in the library yet, but that's another story.)

And finally, thanks in advance to **Jim Fisher** for the great job he's sure to do on the upcoming Hightstown meet. (No pressure from this quarter, eh, Jim? Ask Marv if you can borrow the Santa hat!)

In This Issue, you can catch up on any meetings you may have missed during the past few months (I missed a few myself). The **meeting reviews** provided by **John Ruccolo** may also help to refresh your memory regarding all the good stuff that transpired if you *were* there. Indefatigable **Ludwell Sibley** contributed another pallet-load of fascinating and useful information, including the **Auction Results**, reviews of activities at some of our **neighboring clubs**, and a report on the **demise of ARCA**. We have a growing crop of **buy/sell Want Ads** to feed your acquiring or divesting needs, and another local-interest story in our continuing series on "**Historic Radio in New Jersey**".

You can look forward to even more local interest stories in upcoming issues, and more great restoration tips and other useful information from our own stable of experts and from elsewhere around the world.

Enjoy!



CANAL TELEGRAPH

(continued from page 7.)

ascertain whether any barge was exceeding the legal speed limit. From a historical point of view, Kingston station represented one of the earliest installations of the Morse telegraph in the United States.

Hours for transiting the canal were from 6:00 AM to 6:00 PM, which corresponded with the hours locktenders were on duty. Boats that successfully "locked-through" by 6 PM then proceeded to the next set of locks to be ready for the early morning opening. Canal tolls for coal remained stable over the years at two cents per ton-mile. Barge captains, who were paid \$35 for the trip, were responsible for unloading cargo at destination points.

The Pennsylvania Railroad, pioneers in the use of the telephone for train dispatching, in 1901 got into a hassle with Western Union over contract negotiations which resulted in **A. J. Cassatt**, president of the railroad, ordering the telegraph company off PRR right-of-way. When Western Union balked at the order, the railroad sent locomotives to uproot telegraph poles from their property and arranged with Postal Telegraph to take over the service. Years later (Mr. Cassatt died suddenly December 28, 1906), Western Union telegraph service was quietly restored to Pennsylvania lines.

In the meantime, canal traffic had fallen off precipitously after PRR expanded its main line across New Jersey to four tracks. By 1908 most major railroads had switched over to telephones for dispatching trains on their main trunk lines. Still, the clatter of Morse could be heard in way stations on branch lines.

The State Railroad and Canal Commission let the PRR open and close canal offices at will. As business fell, so did canal appropriations and the number of personnel employed on its rolls. 1933 was the last year of its corporate identity.

Except for urban and industrial areas where the bed has been filled in, the D & R Canal remains virtually intact, 60 years after its abandonment. The main channel, tow paths, locks and sluiceways are still in place as tourist attractions maintained by New Jersey Park Services, augmented by revenue received from the sale of water to townships and business organizations located along the way, the largest of whom is **Johnson & Johnson Pharmaceuticals Company**.

ARCA (continued from page 5.)

ARCA is solvent and in fact not bad off financially. Fears that an infusion of ARCA members might "wag the dog" and redirect AWA unfavorably are similarly unlikely.

ARCA was, it seems to me, a victim of a general shift in the antique-radio hobby. At its founding there was negligible local club activity. CHRS, HVRA, MARC, MAARC, SCARS, VRPS, and other major clubs were embryonic or nonexistent; hence there was no Elgin, Extravaganza, Radio Daze, or Radio-activity (let alone Hightstown!). Today's better local newsletters exceed the *Gazette* in interest and quality. Today's bigger clubs are actually national in scope. ARCA also suffered in later years, I'm told, from internal disunity. The founding members in the Northeast resented the shift of activity to West Virginia - the WV chapter with its museum is now the "center of mass" - but were unwilling to counter it with effort of their own. President McIntyre was eventually stuck with no vice president, troubles in the back office, and the burden of editing/producing the *Gazette*. Major writers drifted away from the *Gazette*, further complicating the task. McIntyre deserves credit for carrying on under wholly unreasonable conditions.

The unfortunate aspect of ARCA's demise is that we lose a voice of diversity in this "industry," just as this year's disappearance of *Radio Age* as a competitor to *A. R. C.* is a loss of a diverging voice. (Sure, *Radio Age* is still with us, as MAARC's well produced newsletter, but it's not the private-enterprise scrapper of old.)

"Competition brings you better goods and services." As member-proprietors of a strong local club, it is up to us to fill part of ARCA's old role. NJARC is not yet ten feet tall, but it's five feet six and growing.

CLASSIFIED ADS

Free classified buy/sell ads placed with NJARC News also run in DHRC Oscillator for extra coverage.

WANTED. B&W pictures, advertising, clip art of radios for scanning into computer. Will share output, possible publication in NJARC News. John H. Dilks, K2TQN, 125 Warf Road, EHT, Mays Landing, NJ 08330. (609) 927-3873.

FOR SALE. Tubes, schematics, service notes, Riders, Sams Photofact folders and Transistor books, etc. for early radios. LSASE for price list. Sam Faust, P.O. Box 94, Changewater, NJ 07831.

CLASSIFIED ADS

WANTED. Information Needed: (1) Values (volts & amps) for transformer low voltage output taps for Electronics Measurements Corp. model EMCC-213 tube tester, sold by Lafayette ca. 1970. (2) Schematic for RCA "Little Nipper" AC or AC/DC AM/SW 5-tube superhet ca. 1939, a.k.a. model 9TX23, 9TX31, 9SX65, & 9SX1 through 9SX8. (3) Moxie "Horsemobile" crystal set ca. 1925, manufactured in Boston area. Thanks, Tom Fallon, 159 Riva Avenue, Milltown, NJ 08850 (908) 545-0417.

FOR SALE. Brunswick Panatope model 288. Phonograph with multiband radio. Majestic model 92 walnut highboy 1929. Best offer. Russ DiRico. 206 Beechwood Ct., Mt. Laurel NJ 08054 235-3773

WANTED. Motorola television, model 21K16 ca. 1954. it's butt-ugly, but I want one. Dave Sica, 1459 St. Georges Avenue, Rahway, NJ. (908) 382-0618.

WANTED. "Radio" juveniles. Ten more titles will complete the collection. Dust jackets preferred but not necessary. Needed: *Radio Boys: Lost Atlantis, With the Border Patrol, Soldiers of Fortune, and Air Patrol* (all by Breckinridge). *First Wireless*, and *To the Rescue* (by Chapman). *Under the Seas* and *Flying Service* (by Duffield); *Cronies* and *Loyalty* (by Aaron & Whipple). Have dupes to trade. Mike Koste 215-646-6488.

FOR SALE or TRADE. *Telephony* magazine, most issues, 1959-63 (a whole copier-paper carton full), VG condition. Ludwell Sibley, (908) -782-4894.

FOR SALE. Emud 923 console radio-phono console, immaculate working order, \$125. Charles Class, (215) 699-7149.

WANTED. Cabinet for Hallicrafters SX-42. Bob Haworth, W2PUA, 112 Tilford Rd., Somerdale, NJ 08083, (609) 783-4175.

WANTED. BC-610 transmitter, pref. "E" or earlier model, in good/restorable cond. Also want BC-683 receiver, BC-924 transmitter, FT-237 mounting for same, TBW HF section or complete transmitter. Steve Davis, 705 13th Ave., Belmar, NJ 07719, (908) 280-9760.

FOR SALE. 64 page booklet describing Federal Tel. & Tel's radio operation from the beginning in 1921 to its demise in 1929. Over 60 illustrations, including pictures of early Federal RF and audio amplifiers, all early radios, and many Federal parts. The article and presentation by Dick Schamberger, Federal expert, are included. All Federal models are listed with the year and month introduced, price new, and brief description. Buffalo's first broadcast station, Federal's WGR, is described. There are two pages of references for more Federal info. This is more about Federal than exists in any other spot! Good-quality printing. To order, please send \$6.25 (includes S&H) to Larry Babcock, 8095 Centre Lane, East Amherst, NY 14051.



New Jersey
Antique Radio Club
92 Joysan Terrace
Freehold NJ 07728