THE OLD TIMER'S BULLETIN

OFFICIAL JOURNAL, ANTIQUE WIRELESS ASSOCIATION, INC.

Published for the Collector, Historian and Old Time Wireless Operator

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Photo from the Murray State University collection.

Nathan B. Stubblefield and son Bernard pose with the inventor's ground current wireless telephone system. *Story on page 32.*

Antique Wireless Association, Inc.

Box E
Breesport, New York 14816

"THE OLD TIMER'S BULLETIN" — THE AWA JOURNAL

The Old Timer's Bulletin is published approximately four times a year by and for members of the Antique Wireless Association, Inc. AWA is a nonprofit historical society founded in 1952 and chartered by the State of New York. *The Old Timer's Bulletin* is available through AWA membership. Its issuance is subject to change from time to time as to frequency, content, and size. It is not liable in any way for any buying-and-selling transaction entered into as a result of its content.

WHOM TO CONTACT

Please write legibly. Enclosing an SASE speeds replies.

Dues and address changes: Joyce Peckham (Secretary), Box E, Breesport, NY 14816, (607) 739-5443; FAX: (607) 796-6230, e-mail: awapeckham@aol.com. Dues: 1 Year, $15; 2 Years, $27; overseas (air-mail), $18. Make checks payable to "AWA."

AWA official business: William B. Fizette, (President), RR 1, Box 55, Henryville, PA 18332, (717) 629-0637.

OTB Submissions: Marc Ellis, Editor, *OTB,* PO Box 1306, Evanston, IL 60204-1306, (847) 869-5016, e-mail: ellis@interaccess.com .

Orders for the *AWA Review* or back issues of *OTB:* Debbie Roloson, 2 Walnut Place, Apalachin, NY 13732, (607) 625-3031.

Want ads and coordination of slide/video shows: Richard Ransley, PO Box 41, Sodus, NY 14551, (315) 483-9307.

Museum operation: Bruce Kelley (Curator), 59 Main St., Bloomfield, NY 14469, (716) 657-7489.

Annual conference business: Bruce D. Roloson, 2 Walnut Place, Apalachin, NY 13732, (607) 625-3031.

Financial reports: Dexter Deeley (Treasurer), 8 Briar Circle, Rochester, NY 14618, (716) 381-9633.

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FROM THE EDITOR

Marconi Archive to be Preserved Intact!

By now most readers of the *OTB* have heard that Christie's auction of the Marconi archives, announced on these pages in the last issue, has been canceled by the General Electric Company, parent company of GEC-Marconi. This surprising, but very welcome, news has raised some interesting questions about the responsibility for stewardship of such priceless legacies from the past, particularly those still under corporate control.

Thanks to AWA member Pat Leggatt, who was pressed into service as the *OTB*'s UK "stringer," we have photocopies documenting the controversy surrounding this unpopular sale as it raged on the pages of *The London Times*. Columnists Nigel Hawkes (Science Editor) and Graham Seargeant, as well as Sir Geoffrey Pattie (GEG-Marconi Chairman), who spoke from the "Letters" column, lay out the issues for us:

In connection with the UK Marconi Centenary (celebrating Marconi's first experiments and patent in that country), The General Electric Company, parent company of GEC-Marconi, decided that "it would be responsible to carry out an audit of the little-known, rarely used and inaccessible archive at Great Baddow, Essex..." The company-retained consultant found that the mostly-paper-based materials were in a deteriorating condition and that long-term preservation would require the construction of a special-purpose building costing £11 million "...far more then the value of the archive." (which was estimated at £1-3 million). Hence the decision to sell.

Columnist Graham Searjeant rebutted: " The archive is really being sold to dispose of a corporate embarrassment." Regarding Chairman Pattie's value-based decision to sell, he comments, "This begs some questions. Would preserving it not cost others just as much? Should the masses of paper therefore be left to rot? Is market value the only value?"

GEC-Marconi's announced plan to use the auction proceeds to produce an interactive CD-Rom disk telling the Marconi story and to fund what columnist Seargeant called "...a politically modish scheme to enthuse secondary school teachers over electronics." did little to pacify the growing number of protesters, led by Princess Elettra Marconi-Giovanelli, the inventor's daughter. More letters protesting the dispersal of this national treasure filled the *Times'* mailbags.

Paul Harvey, Chairman of the British Records Association, responded to the argument that the artifacts might receive better preservation as small lots in individual hands: "...To split up an integral archive in this way is like preserving a set of table silver by selling each fork and spoon separately; its function—its historical value—is all but destroyed." Another reader, possibly reacting to the incongruity of the sale having been stimulated by preparations for the Marconi Centennial commented: "What a wonderful way it would be to celebrate the hundredth anniversary of the Marconi Company in 1977 by giving this collection to the nation, perhaps through the Science Museum (which already has many items of Marconi history)."

Much to the relief of serious radio historians everywhere, a solution involving London's Science Museum *was* worked out. The museum will take responsibility for the conservation of the 250 items of equipment and 750 letters or documents, lending many items for display in Chelmsford, where Marconi set up the first radio factory in the world. Chairman Pattie commented that his company was "absolutely delighted to have come to an agreement with the Science Museum," indicating that GEC-Marconi had tried to explore similar options earlier but was unable to make much progress until the sale was announced.

I am very pleased to have been able to report the happy ending to this little saga, and would like to close with another comment from Graham Searjeant addressing the question of whether public funds should be used to preserve artifacts that corporate owners would like to abandon. "...There is no case for taxpayers to look after the papers of great companies, just to save shareholders the cost. They are responsible for their own heritage, like any other community, and should be held accountable for it...Much of our industrial history has been lost in takeovers. More will be. Aside from selling ephemera to collectors, a sensible solution might be for companies to endow their archives when times are good and to contract out their care to properly financed commercial museum companies."

Meet *The OTB's* New Copy Editor

As you have noticed, I'm sure, I've been advertising for a Chicago-area AWA member to assist with some of the administrative tasks related to publishing *The OTB*. Joe Schroeder, W9JUV, was one of those gracious enough to apply for this volunteer position. After a couple of phone conversations during which we compared our needs with his availability and interests, Joe decided to take on the job of being *The OTB's* Copy Editor.

In this position, he will set standards for how our words are set in type—determining styles for electrical units, standard spelling and abbreviations, punctuation and capitalization, and all of the other myriad decisions that have to be made if our authors' ideas are to be transferred to the printed page with clarity. He will also read all galley proofs to make sure that those standards are adhered to.

This is a service that we badly need, especially in the face of the high volume of copy and the inevitable tight deadlines. But Joe will be in a position to pick up our galleys with a fresh and critical eye, keeping us on track and consistent.

To say we are fortunate that Joe is willing to take the time to do this job for *The OTB* is an understatement. He was the founding editor and producer of *HR Report*, the first amateur Radio newsletter, and a member of the editorial staff of *Ham Radio* magazine, where he was a regular columnist and frequent editorial writer. He is an avid collector of World War II amateur equipment, and a long-time member of both AWA and the Antique Radio Club of Illinois.

Joe has been an active radio amateur since 1946, at the top of the DXCC honor roll since 1979, a VHF/UHF enthusiast with WAS, WAC and VUCC on six meters, and an AMSAT life member and former Area Coordinator. He's also a Life member of both ARRL and QCWA, has served the ARRL as a member of the VHF/UHF advisory committee and the FCC as a member of the advisory committee on Amateur Radio for the World Administrative Radio Conference of 1979.

Professionally, Joe has had his own electronics consulting business for thirty years, doing technical writing, advertising and marketing for a variety of small electronics firms. He was also Managing Editor of *Electronics Instrument Digest,* has long been a staff editor for DBI Books, owns Handgun Press, a small book publishing company, and has authored many books and articles in the gun collecting field.

I think our copy is in good hands, don't you?

—Marc Ellis, N9EWJ

MYSTERY PHOTO ANSWERS — *February Mystery Photo*

Well, as is not unusual, we have a couple of conflicting interpretations for our last mystery photo. Phil Weingarten, of the Forest Hills (NY) Wireless Museum, when offering the photo to the *OTB*, wrote:

...Would you be interested in a photo of Lee DeForest at Kitty Hawk airfield observing Wilbur and Orville Wright getting prepared to fly? I understand that DeForest took some flying lessons from the Wright brothers.....Frank Merriam, a friend and employee of DeForest, took the snap shot with a Kodak camera.

Reader Jerry Simkin offers another explanation:

...The "DOC" in the photo border and the man on the right side of the photo is Lee DeForest. The photo is about the first transmission of voice by radiotelephone from an airplane in flight (1916). I quote from page 339 of Lee DeForest's Father of Radio: "In the summer of 1916 I took my first airplane flight at Mitchell Field, L.I. I took to the air to test out a small radiotelephone transmitter with trailing antenna. The result was sufficiently interesting to persuade the Army Aviation Service to order one or two such sets. These were the first radio telephone sets ever installed in an airplane."

Your editor agrees that "DOC" has to be Lee DeForest, but otherwise leans more toward Phil's explanation. While I'm hardly an authority on primitive airframes, the plane pictured looks a little too early for 1916. Anyone else want to jump in with a comment or explanation?

—MFE

AWA NEWS

OTB Policy on Promoting Events

The *OTB* is pleased to list the meets and meetings of any established antique radio organization, whether or not it is associated with the AWA. Do not send your information directly to the *OTB* Editor. Please send it to Joyce Peckham, Box E, Breesport, NY 14816. Closing date is six weeks prior to first day of month of issue.

CALENDAR OF AWA ACTIVITIES

May 2-3..... IHRS/AWA Regional Spring Meet
May 10.....AWA Northern NJ Spring Meet
May 16-17.....NARC Radio Daze '97
May 17.....AWA Bloomfield, NY Spring Meet
May 17.....AWA Board Meeting
June 14.....AWA Carolina Chapter Swap Meet
Sept 3-6.....Annual Conference, "Television" see p. 10
November 2.....Annual Business Meeting
(see below for detailed information on meets)

CALENDAR OF MEETS

(AWA logo identifies AWA-sponsored events)

IHRS/AWA REGIONAL SPRING MEET
May 2-3

Indiana Historical Radio Society Spring Meet at Signature Inn East, Indianapolis, IN – (317) 353-6966. Setup, Thursday evening, May 1. Banquet Friday evening. Guests from other clubs cordially invited. Contact Ross Smith, 1133 Strong Ave, Elkhart, IN 46514.

AWA NORTHERN NJ SPRING MEET
May 10

Schooley's Mountain, NJ. At The Inn at Schooley's Mountain on Rt 517 (south of Hackettstown). Trader's market 8 am. Lunch available on premises. Info: Lauren Peckham, Box E, Breesport, NY 14816. Please include SASE for reply. (607) 739-5443.

RADIO DAZE '97
May 16-17

Northland Antique Radio club (NARC) in conjunction with AWA and the Pavek Museum of Broadcasting announce Radio Daze '97 at Best Western Golden Valley Inn, Golden Valley, MN. Two day swap meet; visit to Pavek Museum; auction Friday evening; antique radio contest; presentation by Danny Gustafson on RCA radio and TV. Info on registration: NARC, PO Box 18362, Mpls., MN 55418 (Include #10 SASE) or call Don Hauf at (612) 933-9070.

AWA BLOOMFIELD, NY SPRING MEET
May 17

Bloomfield, NY, Routes 5 & 20. At AWA Museum annex and American Legion Hall. Flea market, 8 a.m. to 12 noon. Auction of surplus items from Annex, 10:30 a.m. Buffet luncheon (reserve ahead), 12 noon. Members' auction, 1pm. Info: Bruce Kelley, 59 Main St., Bloomfield, NY 14469. (716) 657-7489.

ROCHESTER HAMFEST
May 30-June 1

Monroe County Fairgrounds, Rochester, NY. Look for the AWA Booth on Saturday.

MAARC "RADIOACTIVITY 97"
June 12-14

Mid-Atlantic Antique Radio Club presents the fourth annual "Radioactivity" event at the Best Western Maryland Inn in Laurel Maryland (conveniently located between Baltimore and Washington) starting Thursday evening June 12 and extending through Saturday June 14th. There will be a giant trader's mart with refreshments available for participants, numerous workshops, presentations and guest speakers. Other events include an old equipment contest, awards and activities for the entire family. Hotel phone is (301) 776-5300 (mention MAARC for a special room rate). Contact Steve Snyderman, (703) 978-3086 for additional details.

AWA CAROLINAS CHAPTER SWAP MEET
June 14

At the North Carolina Transportation Museum in Spencer, NC. This is a restored locomative repair facility with functional roundhouse, operational steam locomotives and a fine collection of antique cars. Picnic shelter nearby. Info: call Ron Lawrence, (704) 289-1166.

RADIORAMA '97
June 27-28

The Cincinnati Antique Radio Society and Antique Radio Collectors of Ohio (ARCO) present the fifth annual "Radiorama," Signature Inn, Florence, KY, I-75 Exit 182, Phone 606-371-0081. Mention radio meet for special rate. Theme "75 Years of Crosley." Crosley radio display and slide presentation of rare Crosleys. Friday, swap meet starts at dawn; Friday afternoon caravan tour of Gray History of Wireless Museum; Friday evening Crosley slide presentation; Saturday, swap meet starts at dawn. Info: Bob Sands (513) 858-1755.

EXTRAVAGANZA '97
July 11-13

Holiday Inn South Convention Center, Lansing, MI. Theme: "Radios of the World" with an emphasis on non-US radios and related items. Flea market, programs, equipment contest, women's luncheon. Special room rate $60.00 per night (block of rooms set aside till June 15th). Reservations: (517) 694-8123. For brochure, send postcard to Extravaganza '97, Suite 100, 3520 Okemos Rd., Okemos, MI 48864.

RADIOFEST XVI
August 6-9

Presented by Antique Radio Club of Illinois. Huge flea market, old equipment contest, auctions, awards banquet, Muchow Museum Visits. Holiday Inn at Elgin, IL (Exit I-90 at IL 31 South). Hotel rate $68.00 per day, 3 days required, call (847) 695-5000 for reservations. For information, write ARCI, P.O. Box 1139, La Grange Park, IL 60526 or e-mail JDISCIP@AOL.COM

RECURRING MEETINGS

• **California Historical Radio Society** —Quarterly swap meets at Foothill College, Los Altos Hills, CA; May 4, Aug. 3, Nov. 2. Exit Magdelena off 280 freeway. The upper parking lot "T" gates open at 8 a.m. Regional events: May 18 (San Luis Obispo); July 6 (San Francisco); Sept. 14 (picnic/meet-near Rio Vista); Oct. 5 (Redding). General address is CHRS, PO Box 31659, San Francisco, CA 94131. 24-hour voicemail info: (415) 978-9100.

• **Cincinnati Antique Radio Society** — Meets third Wednesday of each month. Provident Bank, 8054 Reading Rd. For more information, contact Bob Sands, (513) 858-1755 or Ted Lewis (513) 446-3898.

• **Carolinas Chapter of the AWA** — Meets approximately bimonthly. For more information, Contact Ron Lawrence, President, P.O. Box 3015, Matthews, NC 28106-3015; phone (704) 289-1166.

• **Delaware Valley Historic Radio Club** — This SE Pennsylvania club meets the second Tuesday of each month at North Penn Amusements, 105 Main St. (Rt. 113), Souderton. Membership $10/yr. For info: P.O. Box 41031, Philadelphia, PA 19127-0031, or Mike Koste (215) 646-6488.

• **Houston Vintage Radio Association** — Meets 2nd Tues. each month (except Jan. and Dec.) At Lai Lai Restaurant, Tides II Motel, Houston Medical Center, Main and Holcombe Sts., Houston, TX. Meetings include auction/program, 7-10 p.m. Assoc. publishes *Grid Leak* quarterly, monthly activity announcements. Membership $15/yr. Write: HVRA, PO Box 31276, Houston, TX 77231-1276, or call Richard Collins, (713) 778-0721.

• **Hudson Valley Antique Radio & Phono Society** — Meets 3rd Thurs. of month, 7 p.m. Meeting, swapmeet, and membership info: HARPS, P.O. Box 207, Campbell Hall, NY 10916, or call John or Linda Gramm at (914) 427-2602.

• **London Vintage Radio Club** — This Ontario, Canada club meets in London on the last Saturday of January, March, May, June and November. Annual flea market held in Guelph, Ontario in September in conjuction with the Toronto club. The 10th anniversary of the founding of the club will be celebrated at the June 28, 1997 meeting in London. Contact: Lloyd Swackhammer, VE3IIA, RR#2, Alma, Ontario, Canada. (519) 638-2827.

• **Mid-Atlantic Antique Radio Club** — Meets monthly, usually at New Hope Seventh Day Adventist Church, Burtonsville, MD, Saturdays or Sundays, depending on time of year. Contacts: President Ed Lyon, 11301 Woodland Way, Myersville, MD 21773-9133. (301) 293-1773, or Membership Chairperson Jay Kiessling (410) 239-1818.

• **New Jersey Antique Radio Club** — Meets 2nd Fri. each month, 7:30 p.m. Holds three an-

nual swap meets. Contact (send SASE): Tony Flanagan, 92 Joysan Terr., Freehold, NJ 07728, (908) 462-6638.

• **Oklahoma Vintage Radio Collectors** — Meets 2nd Saturday each month, Spencer's Barbecue Restaurant, NW 63rd and May Avenue, Oklahoma City. Dinner/socializing, 6 p.m.; meeting at 7 p.m. Membership, $12/yr., includes monthly Broadcast News. Info: SASE to OKVRC, P.O. Box 72-1197, Oklahoma City, OK 73172-1197, or call (405) 722-0595 or (405) 755-4139 eves.

• **Ottawa Vintage Radio Club** — Meets monthly (except June and July) in Conference Room, Ottawa Citizen, 1101 Baxter Rd., Ottawa, Ontario. Contact: Tom Devey, 601-810 Edgeworth Ave., Ottawa, ON K2B 5L5, (613) 828-5152. Membership: $10 Canadian/yr.

• **Texas Antique Radio Club** — New club forming in San Antonio area. Meeting dates to be announced. Contact: Joe Koester, President TARC, 7111 Misty Brook, San Antonio, TX 78250-3498. (210) 522-1662.

SERVICE SOURCES AVAILABLE

The AWA Source Sheet is a listing of parts suppliers and services for the radio collector. Cost: only a business-size self-addressed stamped envelope to AWA, Box E, Breesport, NY 14816.

AWA SLIDE/VIDEO PROGRAM

The Antique Wireless Association has available several historical documentaries to loan to affiliated organizations for club meetings and programs. There is no charge for this service other than return mailing cost. For info on loan conditions, to make reservations, or just inquire, contact Richard Ransley, P.O. Box 41, Sodus, NY 14551. The following are available:

VHS Video Programs

V-2 — "Electrons on Parade." 18 min. 1938 movie made at RCA's Harrison Plant showing production lines with closeups showing receiving tubes, including a short sequence on transmitting tubes. (Very rare movie.)

V-4 — "The British Receiver." Documentary of the AWA/BVPS meet with visit to Marconi's Chelmsford plant, the British Science Museum, and ending with series of collectible British receivers. (VHS program transferred from slides.)

V-5 — "The Early Years." Historical documentary narrated by Clarence Tuska telling of the early years of amateur radio, founding of the ARRL and WW I military radio training school. (VHS program transferred from slides.

V-6 — "The Key." History of the telegraph/radio key covering early hand keys, semi-automatics and commercial types. Script by Lou Moreau, W3WRE. (VHS program transferred from slides.)

V-9 — "The Transatlantic Tests and 1BCG." Rare documentary/photographs showing early amateur operation leading to famous 1921 transatlantic tests.

V-12 — "Those Wonderful Magazine Covers." The story of radio through magazine covers. Colorful with period music.

V-15 — "The WHAM Story." Details development of a pioneer radio station in Rochester, NY. Program developed with assistance and recollections of Art Kelly, the station's former general manager.

V-16 — "The Charles Herrold Story." Video prepared by Mike Adams who donated this copy to the AWA. It documents the work of broadcasting's Forgotten Father who started broadcasting in 1912.

Slide Programs

S-1 — "Portrait of a Pioneer." The life of Elmo Pickerill.

S-2 — "Polar Adventure." Pictures taken by Bud Waite and his narration describing numerous trips to the Antarctic over a 35-year period.

S-3 — "70 Years of Vacuum Tubes." Describes the history of vacuum tubes.

S-4 — "The Early Years." (See description for V-5.)

S-7 — "The Transatlantic Tests and 1BCG." (See description for V-9.)

S-8 — "Trip Through the AWA Museum" Covers exhibits and equipment.

S-12—"The Key." (See description for V-6.)

AWA NETS (EST)

PHONE:

Sun. 7247 kHz, SSB, noon (NCS: N4FS); 3837 kHz 3837 kHz, AM 4 p.m. (NCS's: W2ZM & W2AN)

Tues. 14274 kHz SSB, 2:30 p.m. (NCS's KC3YE and W0FXY) 3837 kHz SSB, 8 p.m. (NCS N4FS)

Mon.-Wed.-Fri: 3867 kHz, 9:30 a.m. (NCS: W2HSN)

CW: Daily, 4 p.m., 7050 kHz (NCS varies) First Wed. of each month, 8 p.m., 7050 kHz

2-M REPEATER (Rochester Area)
Mon., 7:30 p.m. (NCS: W2ICE)
Receive 146.820 MHz; transmit 146.220 MHZ

NOMINATIONS FOR AWA AWARDS

It is time to nominate candidates for five prizes to be given at the annual conference.

The AWA Houck Award for Documentation goes to an AWA member who has written several original articles on radio development or history in the *OTB*, *Review*, or other publication. (This can include a book on a related subject.)

The AWA Houck Award for Preservation is for a member who, through personal accomplishment, has acquired and preserved by documenting an outstanding collection of radio artifacts. Send your selection(s) to the Houck Awards Administrator, giving your reasons why the nominee(s) should receive the Award. The address: John Terrey, Box 2, Carlisle, MA 01741.

The BK-*OTB* Award is given to the member who publishes in the *OTB* an article judged to be the most outstanding, original presentation of the award year. For this year, articles in the Nov. 1995 and Feb., May and Aug. 1996 issues will be considered. All AWA members are eligible for this award except those on the Award Committee and the *OTB* Editor. Simply identify the article and the nominee, with reasons for your selection; send to committee chairman Bill Denk, W3IGU, 81 Steeplechase Rd., Devon, PA 19333.

The Taylor Award, in memory of John Taylor, RCA TV Developer, is for "preserving television history." Submissions are invited here, too, to Peter Yanczer, 835 Bricken Pl., Warson Woods, MO 63122.

The Tyne Tube Award is presented, in remembrance of Gerald F.J. Tyne, for contributions to preserving or documenting the history of tube technology. Nominations may be sent, with supporting reasons, to administrator Lauren Peckham, Box E, Breesport, NY 14816.

Award winners through 1994 will be found in the November, 1994 *OTB*; 1995-1996 winners were: AWA Houck-Documentation, Mike Adams-William Orr; AWA Houck-Preservation, Perham Museum Staff-Jerry Vanicek; BK-*OTB*, Dr. Robert Murray-George Michael; Taylor, Morgan Wesson-Albert Abramson; Tyne Tube, not presented-Peter A. Keller.

Please send nominations by August 1 (August 7 for the BK-*OTB* Award).

PHONY FLEMING!

Passed along by a concerned reader, here's a close-up of a tube that was sold as a genuine Fleming valve. It takes an experienced collector to spot the tell-tale signs that give away a reproduction. We do know that the vacuum tubes made by The Royal Ediswan Co. in England used platinum for the leads emerging from the glass press. The leads in the photo (though you won't be able to see this in our black-and-white reproduction) are dumet (copper colored) and the cylindrical plate is spot-welded, a practice not used in 1905. After finding that this item was far from original, the new owner returned it and was lucky enough to have his money refunded.

Annual Conference

THRUWAY MARRIOTT, ROCHESTER, NY, SEPT. 3-6, 1997

WELCOME BACK! At the 36th annual conference, collectors and history enthusiasts will convene, exchange equipment, and learn more about the development of radio and electronics. If you have never been to the yearly "reunion," why not give it a try? Rochester (Henrietta) is just north of upstate New York's beautiful Finger Lakes region, easily reached by car or plane. The site is 26 easy miles from the AWA Museum at Bloomfield.

Advance registration is encouraged. This will allow preassembly of registration material for quick check-in, and preassignment of flea market spaces. Contact Richard Ransley, Box 41, Sodus, NY 14551 before Aug. 28. Formal preregistration materials will be included in the August *OTB*. Unlimited registration at the door.

The Thruway Marriott is a full-sized, full-service hotel. It offers special nightly rates ($85 single, $90 double, $90 triple, $100 quad) up to Aug. 15. For info or reservations, call (716) 359-1800. the Marriott has high-quality restaurant facilities, and other lodging and eating places are nearby.

The hotel is reached from Exit 46 of the new York State Thruway (I-90): take I-390 north to NY 253 west, to NY 15 south. For visitors arriving by air, the location is about seven miles or 15 minutes from the airport. There is shuttle service, 7 a.m.-11 p.m. (specify the Thruway Marriott).

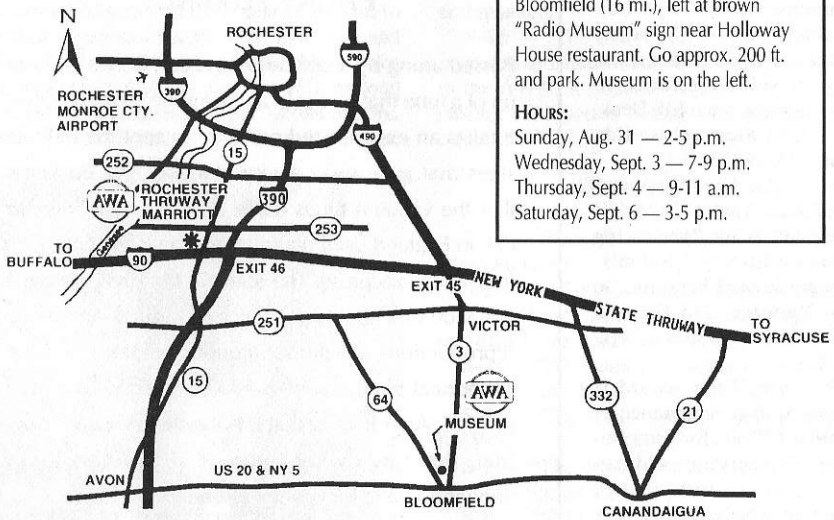
The special theme for this year is "Television."

Conference Chairperson: Bruce Roloson
Program Chairperson: Lauren Peckham
Contest Chairperson: Geoffrey Bourne

AWA Electronic Communications Museum

Village Green, Bloomfield, NY
Refer to map at left. Directions from hotel: Right (south) on Rt. 15. At Avon (9.5 mi.), left (east) on RTS. 5 & 20. At Bloomfield (16 mi.), left at brown "Radio Museum" sign near Holloway House restaurant. Go approx. 200 ft. and park. Museum is on the left.

Hours:
Sunday, Aug. 31 — 2-5 p.m.
Wednesday, Sept. 3 — 7-9 p.m.
Thursday, Sept. 4 — 9-11 a.m.
Saturday, Sept. 6 — 3-5 p.m.



September 3-6, 1997

Theme: Television

Programs

Friday Banquet and Awards
Special Guest: Prof. Malcolm Baird, son of John Logie Baird, television pioneer

Television Lecture/Demonstration Series
Will feature several fine speakers, including Peter Yanczer, David Abramson, Dr. E.E. Taylor, Harry Poster, Robert Lozier, Dave Johnson, Richard Brewster, Floyd Jury, Jeff Lendaro, Al Jones and Stephen Hofer

Prewar Television in the Studio and Home
A slide-illustrated presentation by Nat Pendleton

Key and Telegraph Seminar
A panel discussion moderated by Murray Willer

Collecting Tuska Receivers
Slides and a display of rare equipment presented by Dexter Deeley

Book and Magazine Seminar
Directed by John Terrey

Pre-1912 Wireless and Electrical Equipment Display
With Q&A led by Bruce Kelley

Shortwave Monitoring During World War II
Presented by Robert Grinder

Amateur Radio Forum
The Story of the National SW-3 presented by Paul Bohlander, W3VVS

Vacuum Tubes, Chapter II
Additional history of early tubes presented by Jerry Vanicek

Plus four auctions, annual sightseeing excursion, old equipment contest with special classes for television, ladies' lunch, visits to the AWA museum, book fair, and the usual large flea market.

SEE P. 12 FOR OLD EQUIPMENT CONTEST CATEGORIES

The Old Equipment Contest — 1997 AWA Conference

— Television: From Moving Optical Images to Integrated Electronics —

By Ralph Williams, N3VT, and Geoffrey Bourne, Contest Coordinators

The AWA Old Equipment Categories for the 1997 contest are divided into two major groups: Theme and Standard. The Theme categories reflect the Conference's central historical purpose, to review the evolution of television technology. Your contest coordinators very much appreciate the collaboration of Richard Brewster and Peter Yanczer in the development of the theme categories.

This year we will continue with the Standard categories: Receiver, Transmitter and Craftsman. As in past years, the receiver categories will be determined by the number of tubes in the set and we will have two transmitter categories: Spark and CW. The Craftsman categories offer the many conservation and restoration minded members a chance to showcase their special skills.

The Theme Categories

1. Mechanical Sets—Home and Factory Built—This category is intended to attract the first television picture reproducing equipment and the devices that came before radio-wave transmission. Pre-television devices, e.g., wirephoto, or optical novelties from the turn of the twentieth century are encouraged. Complete sets, reproductions, completions, kits, replicas and even incomplete equipment will be accepted, especially if illustrative documentation accompanies the entry. Resistance-coupled amplifiers and scanning disks belong here.

2. Prewar Electronic Sets and Equipment—Television began to make a major impact on the American home after the development of electronic signal processing. Receivers, transmission equipment and standards changed from near-novelty experiments to serious commercial broadcasting. Examples of receivers of both the direct view and the projection configuration are sought. Timing, transmission and studio equipment also belong in this category.

Craftsmen and TV experimenters built their own sets, often by modifying commercial equipment and also by assembling kits or even starting from scratch. Such sets are most welcome here. World War II military applications of television were based on prewar technology and should be also entered in this category.

3. The Postwar Race for Color —While monochrome TV sets with tiny screens represented the first postwar production, large-screen color sets were coming. Some color was generated by sequential pictures shown through a disk or a drum. Later TV was all electronic, with vacuum tubes doing the signal processing. Mirror sets, projection sets and multi-kinescope sets are out-of-the-ordinary examples of entries for this category. Postwar military applications of TV belong here too.

4. Gadgets, Gimmicks and Novelty Sets—Auxiliary devices were offered to the public to improve reception and picture quality. Examples are: magnifiers, color filters, screens and disks, signal converters and boosters, rotating disks for changing a black-&-white image to color.

All these items would be good entries in this category but don't forget antennas, from rabbit ears to arrays. Not all TV sets were configured like the standard box. Bring in that strange looking set for this category!

5. The Impact of Solid State Electronics—The transistor and its progeny changed signal processing techniques in receiving and studio equipment as drastically as electronics had changed the original mechanical systems. Entries in this category should illustrate the effect of solid state.

The Philco Safari was one of the first but the end is not in sight. Perhaps the Watchman is not a novelty but the herald of a new era. The impact on security and military equipment can also be documented in this category. It is here that the interface with computers, tape equipment and HDTV could generate effective entries.

6. Imaging Tubes and Kinescopes—Very early imaging used arcs to provide enough light for scanning to one or more photo cells. Reproduction used a neon lamp. The crater lamp or tube was also used. When electronic imaging was made practical, a large family of imaging tubes came into service: iconoscopes, dissectors, orthicons, vidicons, plumbicons, and CCDs.

In the electronic age, the CRT and its many variations produced the visible image. The LCD brings in a new way to see TV. All of these examples make very good candidates for this category. There are many special-purpose imaging devices that would also be very welcome.

7. Cameras, Studio Equipment, TV Lighting—The earliest devices might be considered specially lighted mini-studios with spot scanners and photocells. Then came the electronic camera monsters with tubes and pedestals. Later, broadcast cameras were solid-state and could be portable. Downsized cameras became part of security systems and medical equipment. These are all welcome entries. Further development led to personal cameras and spy equipment—also good entries in this category.

8. Technical Documentation and Sales Aids—Textbooks that cover the field of television from its beginning to present-day design, manufacturing and servicing are sought for this category. Also service manuals, specifications and instructions as well as devices that helped in selling and repairing television equipment.

This was internal information, not generally for the use of customers. Enter literature that shows particular manuals, texts, or dealer aids catalogs—or bring in the materials themselves. Books by Jenkins, Nipkow, Zworkin, Farnsworth, Dumont, Baird, Goldmark, etc...

9. Advertising and Customer Documents—In this category we are looking for customer-oriented documents. Magazine ads, dealer displays, giveaways, descriptions of radio or television

Judging the Old Equipment Contest

Every year, people ask how we judge the old equipment contest. Here are the criteria that have been established.

1. Historical Significance
Contribution to the art; contribution to social history; possession by a radio "famous owner;" special circumstances in contestant's family history; contribution to the study of communication.

2. Uniqueness and Rarity
Few of a kind vs. production run (uniqueness); number originally produced (commonness); number surviving (rarity); original use and value (Does the entry amplify, illustrate or illuminate a phase of radio not commonly known? Does it stand out from the rest of the entries?).

3. Quality of Restoration
Cleanliness: Internal and External; craftsmanship of repair, mechanical and electrical; conformance to original design (factory sets); restoration and original construction (home-brews); parts substitution or rebuilding; finish (Cabinet, parts, wiring, insulation, connections, etc. Has the entrant done a craftsmanlike job on the restoration? A super finish does not earn extra points; no points are lost for the ravages of time alone.).

4. Supporting and Illustrative Documentation
Instruction books, service notes, production documents, dealer advertisements, etc.; construction data, plans for kits; original constructor's plans or sketches (home-brews); company history (Has the entrant made the extra effort to gather the supporting information to tell the story of the set on display? Does the illustrative material add significance to the entry? Would the supporting material be competitive by itself?).

During the years that we have been involved with the Old Equipment Contest, quantity and quality have greatly increased. We hope to see you all at the 1997 Conference. Happy hunting!

programs, and customer instruction books are examples of the entries in this category.

The Standard Receiver Categories

10. Passive Receivers—Any detecting device, not including vacuum tubes or solid state amplifying devices, whose purpose is to convert radio energy into intelligent signals.

11. One- and Two-Tube Receivers—Any receiver which uses one or two tubes for any of its functions. A tube or valve that includes more than one electron stream in a single envelope will be counted as one tube.

12. Three-Tube Receivers—The detector-two-stage radio is the most often found example in this category, but reflexes and special-circuit sets are sought.

13. Four- and Five-Tube Receivers—Many radios from all periods can fit here, not just three-dialers. Electric radios that show some special feature will be welcomed.

14. Receivers With Six or More Tubes—Superhets are the usual entries in this class but many other sets qualify, especially the electric radios of the thirties. Most communication receivers can be entered.

15. Novelty Radios—Entries here can range from Mother's Oats crystal sets to teddy-bear transistors, leavened with goodly doses of the All-American Five.

The Transmitter Categories

16. Spark Transmitters and Artifacts—Do not hesitate to enter a major piece of spark equipment if you think it is rare or historically significant.

17. Vacuum Tube Transmitters—Some of the sets for this class are old, some not so old, most home-built. While the predominant entries have been amateur-operated, commercial equipment is welcome.

The Craftsman Categories

18. Restoration of Appearance—The purpose of this category is to display examples of rebuilding and refinishing the cabinets and containers that were used to house radio receivers. There is no requirement for a particular kind or size of set to be entered. A description of the work done will be considered an important part of the entry. The critical element is the appearance of the radio, including woodwork, escutcheons, dials, knobs and other visual details.

19. Restoration of Operation—This is the category for those craftsmen who artfully substitute modern components for old failures. The new electrolytic in the old can is an excellent example. Another is the transistorized tube. Perhaps the replacement of pot-metal parts by silver-gray-colored epoxy castings has been accomplished by one of us. If so, please bring in the set that incorporates that restoration. An entry should be accompanied by documentation showing the basis of the update that preserves the quality of the original.

20. New or Rebuilt—Previously we have encouraged entries that showed the conference attendees how substitutions and reconstructions would provide vital parts or pieces. We also encouraged craftsmen who had made an old function come alive again to bring their work for review. Do you remember the Federal receiver that was entered several years ago and the operating Marconi coherer detector from the year before last? We want to continue that tradition, so bring in your retrospective designs and your reconstructions. There is no requirement for particular devices or circuits.

The Contest Awards

Elle Craftsman—Given in memory of Bruce Elle to a builder of a high-quality radio receiver of an old or new type.

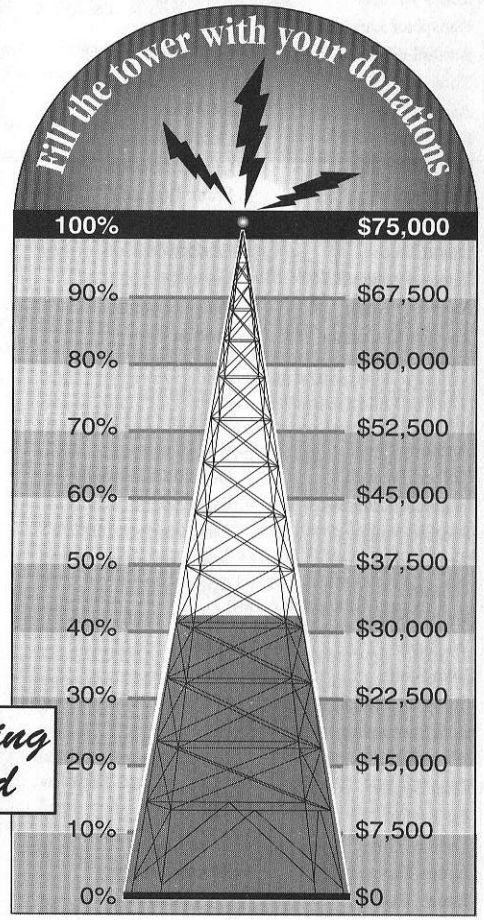
Matlack Transmitter—Given for excellence in constructing or restoring transmitting equipment.

Display—Recognizes the informational value and quality of an exhibit in the contest at the AWA conference.

Thompson Best of Show—Awarded in honor of early amateur Eunice Thompson, W1MPP, for the top entry in the Old Equipment Contest at the Annual Conference.

People's Choice—Awarded to the entry that receives the most favorable votes from attendees and visitors to the contest. All entries including displays are eligible for this award.

MUSEUM FUND DRIVE REPORT



Our museum building fund now stands at almost $31,000, contributed by over 250 members. This brings us to about 41% of our $75,000 goal.

We are very grateful for the monies contributed so far, and are pleased to honor all contributors on these pages. If you haven't yet made a contribution, why not consider joining the ranks of the members who are helping us in this good cause?

Those who would like to donate saleable equipment instead of cash are definitely invited to do so. The donors' names will appear on these pages along with the donors of cash gifts, and all gifts will be acknowledged with a letter that can be used for income tax purposes.

Other vehicles which the members can avail themselves of to aid in this drive are matching funds from corporate sponsors and donations from estates, including both equipment and soft goods such as libraries and special bequests.

AWA Building Fund

Each issue of the *OTB* will include a report on the progress of the building fund along with an updated donor list.

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Stanley Avery
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CURATOR'S CLUB

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Arthur Wilson
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Donald Wriglew
Thomas Zenisek

LETTERS TO THE EDITOR

All letters to the Editor are read with interest and attention, though not all can be published in this column. Letters may be paraphrased, shortened or otherwise edited to fit the available space. The statements made by our correspondents are their own opinions and do not necessarily reflect the views of either the OTB *staff or the Antique Wireless Association.*

Cape Cod/Poldhu Comparison

Intrigued by the "Marconi on Cape Cod" article (May, 1966 OTB*), Desmond Thackeray set about piecing together a more detailed picture of the Wellfleet station's equipment. For this he turned to some experimental notes made by John Ambrose Fleming, then a British Marconi Employee, at the sister station at Poldhu, Cornwall...*

I too found "Marconi on Cape Cod" most interesting. On reflection, I think that apparently incompatible information is bound to arise from the speedy evolution of the early transmitters and the necessity for an author to patch together reminiscences that are based on the state of the art at different dates.

However, it seems to me that the earliest successful transmitter at South Wellfleet would not have differed greatly from that at Poldhu. And although by July 1902 Fleming was probably less involved than previously, he did record in his notebook a few electrical details relating to a visit to Poldhu (to try out what he calls "my rotating discharger with 6" discs." At the time of his July 4th visit, this would have involved studying discharges between adjacent edges of slowly rotating 6" discs without studs, intended to discover whether that rotation would cure the overheating and arcing problems.

One wonders however why he did not also then make any trial of his d'Arsonval (Tesla ?) 2-armed rotor spark gap from British Patent 18,865 of October 1900, or indeed a faster jet of air than he used at Poldhu in May 1901. With these and his patent on air-blast keying (20,576 of November 1900), we can see with hindsight that he had the "cure" for arcing within easy reach even in 1901!

Fleming notes that by July 1902 the Marconi engineers at Poldhu had rewired the Fleming dual-stage transmitter back to a conventional single-stage design, using a 0.2 microfarad condenser, powered to discharge across a 30 mm (static) spark gap. I calculate therefore about 800 Joules per spark; and from this with the available power at 50 Hz I would not expect more than 18 sparks per second.

The new "square" South Wellfleet style aerial was estimated to be about 1/125 microfarad (8000 pF), and the jigger turns ratio 1:9; sad to say, Fleming gives no other useful details. But at least this gives us more than a hint as to what the South Wellfleet transmitter was like at the same date, though it may well have been marginally more powerful and used a slightly larger capacitance.

A year later than that, the jigger secondary at Poldhu had changed (from square ?) to octagonal and was 14" across. Even so, it would hardly by then have been quite as fine as the splendid design of the jigger (is this American Marconi Co. handiwork?) shown in the photo on page 29 of the *OTB* article, which looks to be well ahead of even the wooden-box design of the jigger in the 5 kilowatt British Marconi "battleship" transmitter. The rotating disc with studs seen at floor level might perhaps be a small version of that developed by the Marconi Company for the very large spark transmitter at Clifden in Ireland.

Desmond Thackeray
Surrey, UK

More ECO Background

May I add to the letters you have published regarding ECOs?

The oscillator now called the ECO was first disclosed in an article, by J.B. Dow of the Navy Radio Laboratory, which appeared in the *Proceedings of the IRE* in December of 1931. His oscillator then went on to become the master oscillator in those rock solid Navy transmitters such as the TBK, TBM and TBL of the thirties and thereafter. It was then known as the Dow oscillator. The term ECO had not yet been invented.

It should also be noted that, if the screen voltage for it is obtained from a divider across the source of the plate voltage, the frequency generated by the Dow/ECO can be made quite independent of the variations in the source thus reducing "chirps."

Mention should also be made of the Tritet cir-

cuit devised by George Grammer of the ARRL. This is a crystal controlled ECO which produces strong harmonic output from its plate circuit. As I recall this was brought out in the late forties.

Frank M. Dukat
Los Altos, CA

Tube Testers Revisited

Mr. Grady's original letter on Gm and emission appeared in the August, 1996 OTB. *The two replies (from Alan Douglas and John T. Kaetz, Jr.) were published in the following (November, 1966) issue.*

First, I'd like to thank The *OTB* for providing a forum to discuss the fine points of vacuum tubes and their performance—and testing.

The two letters received in response to my own on Gm and emission were not only enjoyable to read and consider, but prompted further discussion at our end ... both letters were excellent!

During one of these discussions, Mr. Frank Toce of Syracuse Scientific (TV cameras) quite correctly pointed out that Gm is in fact specified only as a ratio of a small change in anode current, to a small change in grid voltage, *and that this ratio is not defined or measured at any particular anode current!*

This implies that if a 6L6 is run with only 1 mA on the anode (instead of 40 to 60), it could still have the correct Gm (as Gm is defined) yet be only emitting 1 mA!

So, we have a tube with *perfect* Gm yet unusable in its normal circuits? Perhaps the tube manuals *imply* Gm is measured at the "tube manual" anode current; however, most real Class A amp circuits, other than output tubes, run the tube at a much lower anode current, usually a fraction of the tube manual value ... so a tube with "low Gm" due to low emission (at the tube manual value ... or tube tester value) may have perfect Gm "in circuit." It depends totally on what current is used for measuring Gm ... which seems to indicate we are measuring emission, not Gm, but it is on a Gm meter!

For example, a 6SN7's or 6J5's parameters are spec'd at 9-20 mA Ip in the RCA tube manual, but even in the highly loaded Williamson amp circuit, it is only drawing 5.5 mA (which is close to 2 watts of plate dissipation—a pretty good stress).

The 6SN7 is also spec'd at 300 mA (peak) for a vertical oscillator rating, or 70 mA peak as a vertical output ... limited to 20 mA average. Thus, a marginal or unusable 6SN7 vertical output (due to low peak emission) will work for years in a Williamson ... yet Gm is whatever it is, and would probably test the same Gm as a new tube, at 5.5 mA ... or 20 mA. We all remember vertical "foldover" from weak triode vertical outputs in early TV's ... but was it Gm or emission that dropped? Or was it Gm, but only at a high emission level?

Frank Toce also provided documentation that quotes no less an authority than Van der Bijl himself, that "Gm is indirectly referred to as 'amplification factor' based on a (given) tube's *mechanical structure*"... no mention of emission level; i.e., $Gm=\mu/Rp$; and $Rp=\Delta Ep/\Delta Ip$.

All of these are set by the mechanical design and size.

All in all, I'd say Hickock did what so often happens today—they found a way to differentiate their product via marketing/positioning, convincing everyone that you need to "test Gm" (certainly *sounds* plausible), came up with a neat circuit (and probably a patent) and ran circles around the competitors! B.S. will always baffle brains, for a while at least!

If I were entering the tube tester business with a new design in 1939, I would have a grid current meter as my "marketing" differentiator! And a calibrated peak emission test of low duty cycle... and a green band for Gm! (Kind of a side product of the other tests... at least then you would know for sure that the grid and plate are in the right place, and are the right size!)

Was any of it real? I don't know, but this sure gets interesting; i.e., how did Hickock pick an Ip to measure Gm at? Is it controlled in the tester at some fraction of full emission? Does it change with each tube type?

Best regards, and again thank you-and thanks to Frank Toce!

John K. Grady, P.E.
XRE Corp.
Littleton, MA

The Loomis Effect

Bill Denk's article on Mahlon Loomis (February, 1997 *OTB*) set me thinking—a painful process at my age. It is very interesting to speculate on the real origin of the effects observed by Loomis.

To begin with, induction fields can surely be ruled out with aerials 18 miles apart. Loomis' theory, which Bill supports, is that partial discharge of a cloud by grounding the transmitting kite wire would appreciably reduce the charge on another cloud into which the receiving kite was flown. But with clouds 18 miles apart this strikes me as rather doubtful.

Another thing I find difficult to go along with is that Bill, very reasonably, interprets Loomis' description "with the same precision as if it had been attached to an ordinary battery" as meaning that the receiving galvanometer needle remained deflected for the whole thirty seconds during which the transmitting aerial was grounded. It seems to me that Loomis' wording is not all that precise and does not rule out a possible meaning that the needle was momentarily deflected at the start and finish of the thirty second period.

Bill says that Dr Loomis' galvanometer was not a useful detector of electromagnetic waves: but can he be sure of this? The magnetics of the galvanometer would very likely have given a non-linear response to radio frequencies, thus affording the necessary detection action. Admittedly the sluggish response of a galvanometer would make it very insensitive as a detector; but the transmitted radio pulse could have been highly damped with nearly all the energy in the first half-cycle and the instantaneous power quite high although of short duration.

So my conclusion remains that Loomis was observing electromagnetic wave transmission, although — and please keep this to yourselves as I wouldn't like it to become common knowledge — I have been known to be wrong!

It would indeed be an interesting project for an AWA member to replicate Loomis' experiments. But although Benjamin Franklin got away with it, I shall leave it to someone else to fly kites into thunder clouds.

Pat Leggatt
Surrey, UK

Needed: Plywood Cabinet Lore

I am currently researching an article on the history of the plywood radio cabinet from 1946 to 1956 and I'm hoping some of my fellow members of AWA can help me locate information on the manufacturers of these inexpensive alternatives to the Catalin radio enclosures.

The larger radio companies like Zenith, R.C.A., or Bendix would often produce the chassis for their radios but would sub-contract the manufacture of the radio cabinets to some local cabinet maker. While most of these shops seem to be leftovers from the war effort, many survived by making other plywood goods such as furniture and hi-fi equipment. Most such shops would produce the cabinets and grills as well as put the finish on the cabinets.

It is these companies, with names like Plyform, Ply-Craft, Plymade of Chicago, Evans Plywood Molding Co. of California and Michigan that I need information about. In addition any information about any company engaged in the manufacturing if radio cabinets is needed. Do any of my fellow readers have memories, photos, catalogs or older magazine articles on this subject? Any and all leads or information would be, of course, greatly appreciated. I am looking forward to sharing this chapter of radio history with the members of the Antique Wireless Association.

Steven Cabella
500 Red Hill Ave., San Anselmo, CA 94960

Gioia Marconi Braga Tape?

Did anyone obtain a good videotape copy of Gioia Marconi Braga's keynote speech at the 1995 Conference? It would be great to have a few copies in the AWA archives. We would like to borrow the master tape, if possible, or a 2nd generation dub, so it could be included in the AWA tape library. Please contact Bruce Kelley or Bill Fizette (contact information on pg. 2) if you can be of help in this matter. Your tape will be promptly returned after a copy is made.

Tom Rosica, W2GIR
Batavia, NY

SILENT KEYS

Bruce B. Adams, W1UPB
Eugene Black, W2LL
Reginald Collins, KA2QPC
Cliff Daykin, W2AFE
Gordon Donaldson
Bill Findley, W3FEA
Milton Freuhauf, W8TZ
John Glisson, N4WUY
Joe Meyers, W2VW
Dave Smith, N2KSZ
Ray Waldo

Cliff Daykin and Joe Meyers were contemporaries, each aged 96, both having started in radio before World War I. Following the war, Cliff's spark signals could be heard as 8AFE and Joe's as 8VW. We'll miss them both at AWA events. Gene Black was an old-time ship radio operator and former magazine editor; he was a great AWA supporter. AWA lost one of its younger members with the sudden death of Dave Smith at age 37. Relatively new to amateur radio, his enthusiasm was felt by all who met or worked him on the ham bands. —Bruce Kelley

AMATEUR RADIO

By Bruce Kelley, W2ICE
59 Main Street, Bloomfield, NY 14469
Please include SASE for reply.

1929 QSO PARTY RESULTS

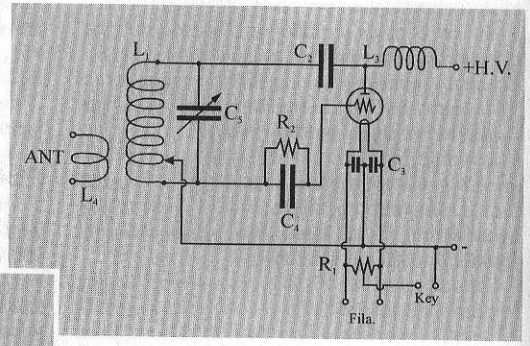
Two Weekends

Fortunately, the event covered two weekends since the first saw frequency operation confined between W1AW and a RTTY contest above 3590. Additionally, the band folded up early—around 7:30 pm. The second weekend saw more favorable conditions, an indication that future events should be for two weekends. Further, some thought may be given to having operation between 3565 and 3580 kc.

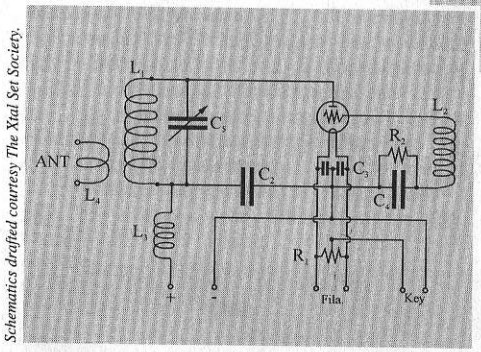
Results

Congrats to W2IRS, who was closely challenged by K3DZ for top number of contacts. Again, a small group of old timers kept the West coast alive in 6 and 7. But where were the 5s, 9s, and 0s? The final score sheet shows Hartley the favored circuit (21 entries), followed by TNT (10), TPTG (9), and MOPA (4). There were several QRP sets using 201-A and 227 receiving tubes, while W2FCH operated a TNT actually made in 1929!

Receivers were a mix with half using pre-war sets, including several home-brew (HB) superhets. The prize goes to Bob, W2HBE with his 3-tube regen receiver using 201-A's. I tried using my SW-3 several times but gave up because of the heavy QRM. Speaking of SW-3, W3VVS has eight with no two alike. How about a talk or article, Paul?



1929 Hartley Oscillator



Schematics drafted courtesy The Xtal Set Society.

1929 TNT Oscillator

Signal Reports

As one who was on 80 CW in 1929, I can confirm that all signals heard were typical of the period: T9, T8 chirp, T5 growls, and self-rectified AC! Doubt the latter? In 1929 many stations used raw AC on the plate. Check the ARRL *Handbook*, 4th Edition, p. 92 for the schematic. Some contestants maintain that a T9 note should be required, but many others comment that running low power with other than a T9 note once a year won't hurt anyone and will bring back fond memories.

1997 Event

We're taking your address from current log entries for future mailing labels. You will receive information for the 1929 contest and a blank log sheet in October. Planning to enter in '97 but don't have a rig yet? On these pages you'll find schematics and specs for the two most popular period transmitter styles used in the contest. Pick the Hartley or the TNT...and enjoy! — 73, BK

Specs for 1929 Hartley or TNT Transmitter

L1 Plate Coil: 12t ¼" copper tubing (or 18t #12 wire) 2½" dia.
L2 Grid Coil: 60t #30 d.c.c. 1" dia.
L3 RF Choke: receiving type
L4 Antenna Coil: 3t. at end of L1
C1 not used
C2 .002 mfd., 600V.
C3 .005 mfd., 600V. (two used)
C4 .0025 mfd.
C5 .0005 mfd. variable (good quality receiving type)
R1 75 to 100 ohm center tapped (if transformer filament winding is center-tapped, eliminate resistor and use the transformer c.t.)
R2 10,000 ohms, 5 watts

These specs are not critical. All components can be receiving type if plate supply is less than 500 volts. Plate coil L1 must be isolated from antenna through coupling network. Use any one of the following period tubes: 201-A, 112-A, 245 or 210.

Top Ten Scorers

NO.	CALL	#CONTACTS
1.	W2IRS	37
2.	K3DZ	36
3.	W1DDW	34
4.	W5WS/3	32
5.	W2ER	31
6.	W2HBE	31
7.	W2ZM	30
8.	W2AO	29
9.	W4VBX	25
10.	W2AN	24
	N2TWW	24
	K4LJH	24

CALL	# CONTACTS	TX	RX
W1DDW	34	Hartley	—
W1KSK	18	210 Hartley	1937 HRO
W1FPZ	17	210s MOPA	HB superhet
KA1CFQ	11	Hartley	—
W1YJ	5	PP245 TPTG	FBXA
WIVZR	—	Hartley	—
W2IRS	37	203A Hartley	—
W2ER	31	210 PP TPTG	1939 superhet
W2HBE	31	227 TNT	3-tube HB
W2ZM	30	210 Hartley	Super-Pro
W2AO	29	Hartley	HQ-120
W2AN	24	210 TNT	HQ-120X
N2TWW	24	201A TNT	Mod.
W2FCH	23	Orig. TNT	—
W2LYH	23	211 Hartley	1936 HB superhet
KE20	14	201A TNT	—
AA2YV	13	Hartley	Mod.
KB2PLW	10	227 TNT	—
N2KSZ	7	Hartley	—
W2ZE	6	TPTG	—
N2EZ	2	TPTG	—
AA2CU	—	Hartley	—
K2LP	—	TPTG	—
W2LDM	—	MOPA	—
W2TM	—	TPTG	—

CALL	# CONTACTS	TX	RX
WB2AWO	—	MOPA	—
W2TFL	—	TPTG	—
K31DZ	36	227-46 MOPA	75-A4
W5WS/3	32	Hartley	—
KD3OR	22	Hartley	—
W3VVS	12	210 Hartley	HQ-120X
W3BYM	—	TNT	—
W4VBX	25	210 TNT	1936 HRO
K4LJH	24	211 Hartley	1936 HRO
AA4RM	—	Hartley	FBX
W4LN	—	Hartley	—
W5EU	—	MOPA	—
K6TQ	10	210 TNT	1936 HRO
W6TDP	8	Hartley	—
K6ILM	5	Hartley	FB-7A
W6DJX	—	TNT	—
W6NLJ	—	—	—
W6NVN/7	8	PP 210 TPTG	—
W7LNG	7	850 TPTG	Mod.
K7YIR	4	Hartley	—
W7LOG	3	210 TNT	—
W70S	—	MOPA (2) 45's	—
NI8G	13	TPTG	—
VE3CUI	32	245 Hartley	Mod.
VE3KSK	—	Hartley	—

The DeForest Gang Hits Colorado

By Wayne Gilbert

PART 1 — THE MONEY ROLLS IN

The author wishes to thank Bruce Kelley, Curator, Antique Wireless Association Museum, for his help and encouragement in the development of this article.

Dr. Lee DeForest and his gang of promoters took Colorado by storm. They arrived in 1904 like a modern day version of Butch Cassidy's "Hole in the Wall Gang," intending, in the best Cassidy tradition, to leave the state with their bags packed with loot and the posse following in a distant cloud of dust. True enough, the DeForest gang didn't rob any banks and didn't use guns, but nevertheless when they left town, they took more Colorado money with them than Butch Cassidy ever dreamed about.

CONTRACTS FOR WIRELESS STATION UNDER WAY

J. G. Darden of Chicago, one of the largest stockholders in the De Forest Wireless Telegraph company, was in Denver this morning and said that the construction of a $100,000 wireless station will be begun in this city within two weeks. Mr. Darden denied the report that Colorado Springs is also to have a station. "Denver will be provided, however, with a fine station," he said. "We are going to start work upon it within two weeks and expect to have it finished and in operation early next year.

"Our system and company is in this field to stay. We are not yet ready to say where we will build, but will make this public in a short time. The erection of the station itself is not so difficult a matter as the installation of the apperatus. We will spend $100,000 before we get things in working order."

President White of the De Forest company was expected in Denver from Chicago Saturday, but word was received that he would not be able to come. In his absence Mr. Darden is looking after the plans of construction. Should the Denver experiment be successful, as the promoters are confident, local capital will be enlisted in the undertaking. Several sites in different elevated parts of the city are under consideration. One of these locations sufficiently removed from the rush of the city will be chosen.

The light, rarified air of Colorado is said to be especially well adapted for electrical transmission.

Hitherto the wireless stations have been confined to cities on the coast, mainly. The De Forest company has stations at Sandy Hook, in New York harbor, Nova Scotia and other points along the Atlantic seaboard.

Denver paper announces opening of new Marconi station.

Lee DeForest's life was not an easy one and money, or rather the lack of money, seemed often a prime consideration in his choice of actions. He spent his early life in Alabama living with his parents, who were ministering to some of the poorest people in the state. He credits this period as the time when he decided to become an inventor and when he first started haunting public libraries in search of information that he could convert into practical, patentable ideas.

He acquired his higher education at Yale University, but even while there he seems to have felt himself an outsider without the financial means to enjoy the life that most of his classmates led. He reports that he often spent his time alone in the library or the laboratory, to avoid having to admit to his poverty.

His financial problems continued to plague him even after he left Yale, and this constant worry about how to finance his experiments and ideas seems to have led him to be receptive to the financial schemes and chicanery that would later tarnish his reputation and nearly land him in jail.

His biography reads like a chronicle of companies and corporations that were either over-promoted, under-financed, or in a constant state of corporate manipulation. He claims to have filed more than 300 patents in his life, and many of these were the assets he whisked out of collapsing companies to be used as startup assets in some new enterprise. This was often done in a manner that would lead others to question the moral and legal intent of DeForest and his colleagues.

One of the more notorious and essential members of the DeForest gang was the promoter, Abraham White. White was the quintessential promoter of any time, personable, clever, a salesman *par excellence*, and a man willing to gamble everything on a new idea or on what he might be able to promote as a new idea.

With reportedly nothing but nerve and audacity, White had successfully bought several million dollars of U.S. bonds with someone else's money, and when the dust had cleared, he reportedly pocketed a profit of $100,000 from this audacious deal. He was flushed with success and looking for another adventure when he was introduced to Lee DeForest who believed that, with the appropriate financial backer, he could be the man to develop a wireless telegraph system. Thus, in November of 1901, Dr. Lee DeForest, inventor, and Abraham White, promoter, each felt they had met the partner of their dreams.

The American DeForest Wireless Telegraphy Company was organized and incorporated in 1901 and a stock issue worth $3,000,000 was authorized. An earlier company started by DeForest and some friends, with its patent fights, equipment, and inventions became a part of this new entity, and DeForest and White set out on the trail that was soon to bring them to Colorado.

As a technology, wireless telegraphy struggled to survive, with its successes due largely to the interest of the U.S. Navy. DeForest's crews installed transmitters and receivers along the Eastern sea coast down to Key West and with a lot of effort were able to maintain contact with Navy ships stationed in that area. Slowly their successes came to the attention of commercial shipping organizations, who recognized the potential of this new media for their ship-to-shore communications.

White used these installations and other purely promotional stations to keep the public's awareness and enthusiasm racing along at a higher pace than the level of the technology warranted. With his obviously somewhat biased encouragement, the public could see no reason why wireless telegraphy shouldn't replace the conventional overland wire telegraph immediately, and White began looking for the right place to

Elmo Pickerill, former AWA member and now a Silent Key, operates an American DeForest Wireless Telegraph Co. station in Colorado, 1906. Fixed-gap spark transmitter has condenser made up of 18 Leyden jars; receiver (center) is a 3-coil tuner with electrolytic detector. (Photo Courtesy AWA Museum)

capitalize on this belief. In making his decision for the launching of this pioneering effort there were several issues to consider; but to White, the main issue seems to have been the ease with which speculative stock issues could be floated, and in that regard, Colorado won hands down.

Mining speculation had made some Colorado investors rich and many more eager to become the next millionaire. It seemed that in Colorado even the densest investor could see that "today's simple hole in the ground could be tomorrow's gold mine" and that many times the fellow without money for lunch might have a bag full of gold nuggets in his pocket by dinner time. Promoters and con men had found many Coloradans would buy stock in these dreams, and if the dreams didn't materialize they would beg promoters for another chance to buy more dream stock.

Abraham White must have thought he had died and gone to heaven when he first heard about this passion of Colorado's investors and how Colorado's laws were designed to protect speculators and promoters, but even he couldn't have guessed that he and others in the DeForest gang would sell more than $2,000,000 worth of wireless telegraphy stock in Colorado.

White prepared Coloradans for the arrival of the DeForest gang by keeping frequent articles about DeForest's new wireless telegraphy ventures in the Eastern press. Then, as the frenzy of Colorado's speculators built, he hired Denver investment broker Christopher Wilson to handle the stock issue in Colorado. Soon he and Wilson promoted an article in the *Denver Post*, telling of contracts being sought for the installation of a new wireless station by the American DeForest Wireless Telegraphy Company and, with that, the scam was launched,

By March of 1905, the DeForest organization had rented office space[1] in downtown Denver and within a month, Denver's *Rocky Mountain News* and Boulder's *Daily Camera* were reporting that Boulder's news stories were being transmitted from Boulder[2] to Denver via DeForest's wireless telegraph system. After that, the transmission of any kind of news was promoted, and soon it seemed that the public had forgotten there were telegraph wires crisscrossing Colorado and even linking Colorado with the rest of the world. Abraham White and Christopher Wilson had done their work well, for eager buyers were soon paying even more than par value for stock shares.

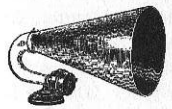
It has been argued that Lee DeForest was only a pawn of White, Wilson and other promoters. DeForest later said they used his name and prestige to further their own aims and that they made fraudulent statements about his equipment and systems without his knowledge. This may have been true in some cases, but it should be noted that DeForest later acknowledged knowing of the big Colorado promotion at its earliest stages. DeForest also admitted knowing about the problems and shortcomings his wireless telegraphy system was having with overland transmissions from the beginning, and he even admitted having reservations about over-promoting the system's capabilities as an overland wireless telegraphy system. Even with these reservations he saw fit to visit Colorado at this time, and there can be little doubt that his presence lent credibility to claims being made by his promoters and stock salesmen regarding the capabilities and future of wireless telegraphy, both in Colorado and the world.

Whatever DeForest's personal feelings and/or involvement, the sales of stock in the American DeForest company continued to soar throughout 1904-05. Plans for new Colorado stations were announced to the newspapers, and no opportunity to promote the system was missed. For example in 1905, as part of the state's July 4th celebration, Governor Jesse McDonald announced he had received an Aerogram from the DeForest station in Colorado Springs[3], and as a further part of the celebration Dr. DeForest took a tour to the top of Pike's Peak.

As the summer of 1905 rolled on, Colorado investors' money rolled in. Wireless telegraphy stations were installed in Ft, Collins[4] and Cheyenne[5], and a link with Kansas City via a station in Salina, Kansas, was proposed. Other proposed stations were to be located in Cripple Creek, Leadville, Trinidad and Pueblo. Each announcement of a new or proposed station was heralded by more enthusiastic investors, and by the fall of 1905 it is estimated that more than one million dollars in stock had been sold in Colorado. This was good news to the promoters, but by then they must have known that the new system still wasn't working as a practical replacement for wire telegraphy.

NOTES

1. This office was located in the Mining Exchange building.
2. The Boulder station was located at 2026 14th Street.
3. The Colorado Springs Station was located on the Colorado College campus.
4. The Fort Collins station was located in the Northern Hotel.
5. The Cheyenne, Wyoming, station was located in the Interocean Hotel.



THE LOUDSPEAKER

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Please include SASE for reply.

King AM-PLI-TONE

The March, 1922 issue of *Radio News* magazine carried a half-page advertisement for King "AM-PLI-TONE" of 82 Church St., New York City, N. Y. The product was, of course, the King "AM-PLI-TONE" horn speaker. No other products were ever mentioned in the KING ads. The company advertised from March through August of 1922, and they also advertised in *Radio* magazine from March through July of 1922.

The advertising material was much the same with some minor variations. The horn sketch shown in each ad included rubber grommets for the headphones, used as drivers, to rest on. Descriptive words used to identify the horn were "polished aluminum body and nickel plated base and horn." Later magazine ads added "No sheet metal is used, the '*Tinny*' sound is left out." Some advertisements cautioned "*Warning: All infringers of this device will be vigorously prosecuted.*"

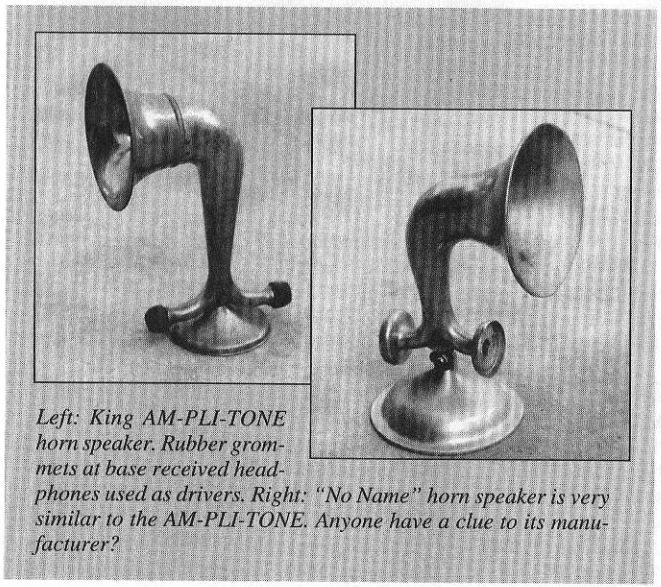
The author's horn has reddish paint in the throat of the neck and underneath the base. Other horns have been seen with the same color in the throat. Embossed under the base are the words "Pats. Pending," "KING," and "AM-PLI-TONE."

In 1983, the author made a survey of horns in 81 collector's hands. Of the 1,242 horns that were reported, eleven were made by KING AM-PLI-TONE, or about one out of every 110 horns in the collections.

No-Name Horn Speaker

Most radio collectors have a no-name item or two in their collections, and I'm no exception. In my possession for over fifteen years is a horn speaker with no identifying markings. There are no initials, emblems or clues. I continue to search the literature for a sketch or tell-tale sign but have found nothing yet.

The solid aluminum two-piece horn is 15 inches high and has a bell diameter of 7½ inches. The cups to receive the headphones are 2½ inches i.d. The horn was most likely made in the same time period as the KING unit, and was probably manufactured by a foundry. Rubber or felt pads were likely used within the headphone cups. Does anyone have one of these horns or a clue about the manufacturer?



Left: King AM-PLI-TONE horn speaker. Rubber grommets at base received headphones used as drivers. Right: "No Name" horn speaker is very similar to the AM-PLI-TONE. Anyone have a clue to its manufacturer?

The MOPA Revisited

By John F. Rollins, W1FPZ

During the latter half of the 1920s the "Master Oscillator-Power Amplifier," or MOPA, circuit attained a certain degree of popularity in amateur circles. These transmitters utilized various combinations of tunable oscillators coupled to a power amplifier. The tubes used in the oscillators were generally the 01A, 202 and 210 types in Hartley or Colpitts circuits.

Judging by the varied experimental efforts with the MOPA, as reported in early *QST* publications, one can only assume that there were some problems of chirp and instability in the circuits. A perusal of some of these early circuits suggests a few areas where these problems might have occurred.

Hoffman, July 1927 *QST*, described his approach to the oscillator-amplifier combination in his excellent article, "A Constant Frequency Transmitter." He used the 201A tube in a Colpitts oscillator to drive a 210 amplifier. A power supply from "B" batteries provided 180 volts for the plate of the 201A. A separate high voltage supply was used for the 210 amplifier.

Cooper, January 1929 *QST*, took a different approach to the MOPA in his article, "A Crystal Note Without a Crystal." He used a 210 tube in a modified Hartley oscillator operating on 160 meters, and then doubled to 80 meters with a 203A amplifier.

Several generalities may be expressed here concerning the MOPA, at least on the basis of this writer's experience.

1. The greatest advantage of the MOPA system over the self-oscillator is the freedom from frequency wobbles during transmission when the wind is blowing and thus swinging antennas and/or feeders.

2. With proper design and tuning, an excellent signal can be attained in a MOPA circuit.

3. A modest power increase can be realized over the self-oscillator.

4. There is really not enough drive from a 210 oscillator to permit a 203A amplifier to develop its full power rating without compromising stability and signal quality. If the 210 oscillator is driven near its maximum, that is with 500 or 600 volts at 60 mA on the plate, instability in the form of chirp and also frequency drift may occur.

5. Interaction between the oscillator and the amplifier can be troublesome, especially with higher powers. Thus any minute change in resonance of the amplifier stage will affect the frequency of the oscillator.

6. Frequency creep as a result of this interaction can be a problem with some MOPA circuits. Frequency creep results from the rise in heat in the amplifier tube elements during keying. This changes the resonance point of the tank circuit ever so slightly. Since there is a certain amount of feedback from the amplifier to the oscillator, the result is a gradual change in the frequency being generated by the oscillator. Fortunately, frequency creep can be minimized by conservative design — not always applied in the nineteen twenties!

7. Separate power supplies are strongly recommended for the oscillator and amplifier stages of a MOPA. A single power supply serving both stages, such as used in some of the early circuits, almost precludes any hope of a steady DC note free of chirp and drift.

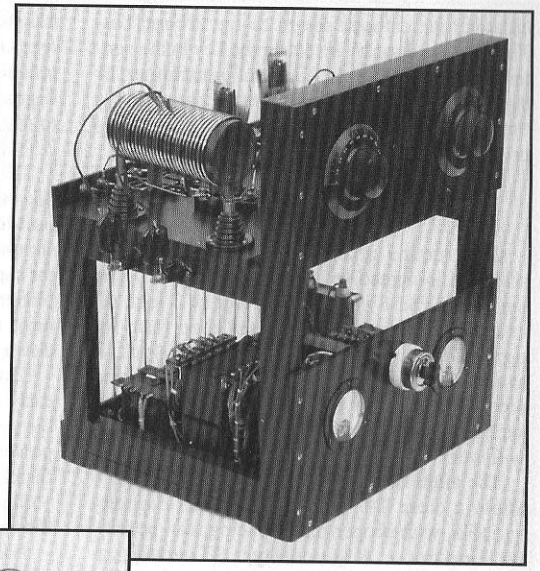
8. A low powered oscillator, operating from a well designed power supply, and feeding a conservatively designed amplifier, is capable of producing a very clean DC note. Such a transmitter was built for use in the "1929 or Earlier" QSO party, adjusted for 9 watts under the new rules. It was also used in the last February contest, adjusted for 24 watts input.

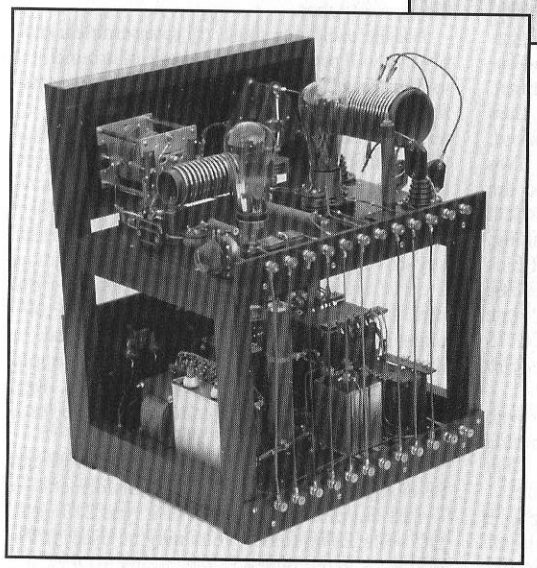
Construction

The MOPA rig can be a fun project for builders and tinkerers, such as myself. Furthermore, recent changes in the AWA rules for "1929 or Earlier" transmitters hopefully will provide some incentive to "go MOPA" on the 80 meter band.

The basic circuit is simple and straightforward. The main activity will be to start gathering up the needed parts. The selection of parts is variable, depending on the treasures found in the ham junk box and also successful foraging at the local hamfests. Keep in mind that while this particular MOPA uses type 210 tubes in both the oscillator and the amplifier, there is nothing sacred about these tubes. The guiding criteria really is centered around the availability of the two filament transformers. Type 45 tubes will work well in one or both stages. The 201A tube will work as an oscillator, as will the 202. Only the supply voltages will be different.

Structural configuration and layout of the major parts can be on anything from breadboards to standard chassis. Hurni, (December 1982 *OTB*), built a very attractive MOPA on a breadboard based on a 1928 *QST* design. A two deck wooden framework is recommended both for electrical efficiency and compactness. Power supplies are located on the bottom shelf with the RF deck above. A third shelf can be added to hold the antenna tuner, if desired. If plywood or bakelite is used for the front panels, it is recommended that two squares of thin aluminum sheet be mounted on the backside of the panel behind the tuning capacitors to minimize hand capacity effect. These shields will need to be tied to the ground bus.





John Rollins' meticulously built period MOPA rig would be right at home on the pages of a 1920's QST.

Oscillator Construction

A type 210 tube is used in a Colpitts circuit, as shown in the diagram, but a Hartley oscillator will work just as well. For the Colpitts oscillator, a high-C tank circuit is attained using a pair of .001 pf mica capacitors across the coil for the 80 meter band. These fixed capacitors may be increased to 1500-1600 pf each if the MOPA is being built solely for use on 160 meters. However, I found that the .001 pf caps seemed to work just as well for 160 or 80 meters. This certainly makes band changing simpler since one only needs to plug in a different coil for the desired band. This particular MOPA is used for both 80 meters and 160 meters and coils for the two bands are interchanged by using banana type jacks mounted on porcelain insulators. A dual-stator National Type DX 250 × 250 pf variable was used across the coil in the current MOPA, but a single stator variable of about 150 pf will work just as well.

The oscillator coil can be hand wound from ⅛" copper tubing for "authenticity," or wound with No. 12 wire. In either case consideration should be carefully given to rigidity of the coil mounting.

If the builder is striving for period authenticity for his MOPA, the two plate RF chokes should be hand made (see component notes). Otherwise, standard 2.5 mh chokes can be used. A potentiometer should be used in series with a fixed resistor in the grid circuit of the oscillator. This will permit varying the grid bias for the best note.

Keying is accomplished by breaking the os-

cillator tube cathode return to the ground bus. This may be done by inserting the key in the center tap to ground of the filament transformer, or through a 20-ohm center tapped resistor across the filament leads if the filament transformer has no center tap.

Amplifier Construction

Construction of the amplifier is straightforward, as indicated by the circuit diagram. The tank coil is best wound on a piece of 3 inch diameter PVC pipe. This makes a good form for rigidity, but a piece of AIR DUX coil stock, if available, will also serve. I wound a "period type" RF choke, but any transmitting type choke, such as made by National, Hammarlund or other, will work.

The amplifier must be properly neutralized to attain a clear T-9 signal. Any small-capacity variable, with proper plate spacing, can be used for this purpose. A National type ST variable capacitor can be rebuilt into a fine neutralizing capacitor if you have or can find one at a Hamfest. The original capacitor can be disassembled, then rebuilt with three stator plates, double-spaced, and four rotor plates also double-spaced. Two small cylindrical insulators, screwed onto the ends of the stator rods, will permit a vertical mounting of the capacitor for convenient tuning.

The amplifier tube will require a small bias pack for the grid circuit. Parts for the pack can be purchased at any Radio Shack store. For a plate voltage of 500 to 600 volts you will need 75 volts of bias. A 400 volt plate supply will require about 40 or 50 volts bias.

The amplifier is coupled to the oscillator with a 100 pf mica capacitor. Some experimenting with the value of this capacitance, between 50 pf and 250 pf, may be necessary for best results.

Early circuits show that the coupling lead from the oscillator coil was tapped down on the coil for best power transfer. I did not find this necessary on my MOPA for 80 meters. However, for the 160 meter coil, it was necessary to tap down 3 turns from the grid end—so be sure to try it. Incidentally, an excellent tapping clip can be found at Radio Shack. These are tiny copper, alligator style, clips. Turn the smooth ends inward slightly to assure a good grip on the coil wire.

Power Supply Considerations

Separate power supplies are strongly recommended for the best results with a MOPA. First consideration is the availability of filament transformers. The 7.5V transformer for the 210 tubes these days is a rare item. However, a 6.5V transformer will work for a 210 with only slight degrading of the power output. If the builder opts to use type 45 tubes for his MOPA, the required 2.5V transformer will be much easier to find.

The choice of rectifiers for the two power supplies is optional, depending on the whims of the builder. To be strictly authentic the builder should use the type 280 rectifier for the oscillator supply and a pair of type 81 tubes for the amplifier supply. However, the above types will have a considerable voltage drop during key-down transmission.

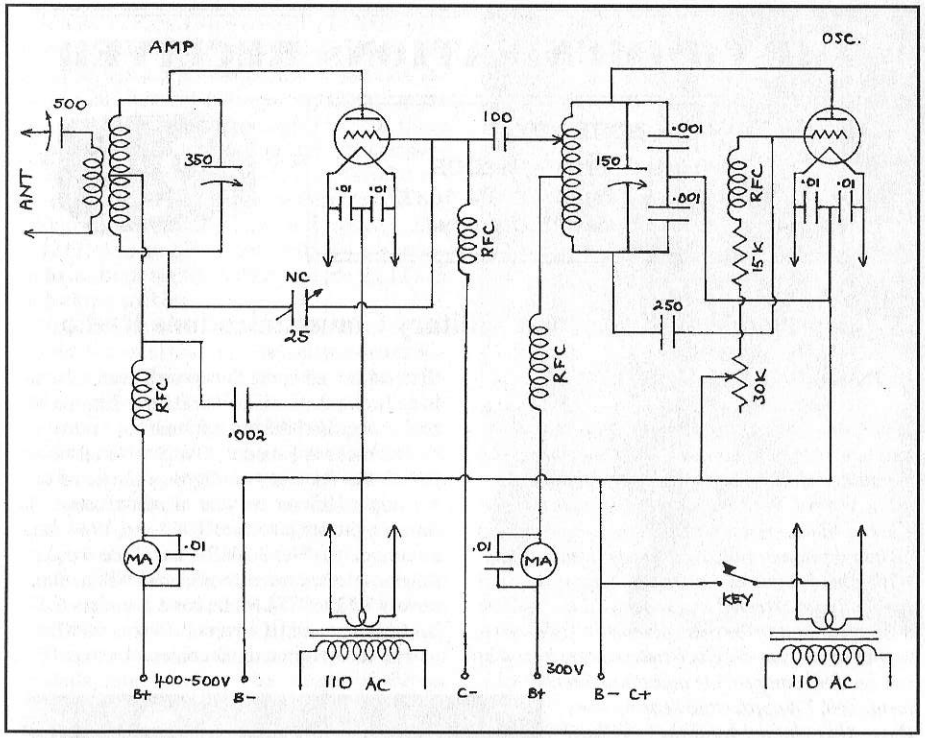
The type 83 rectifier, developed during the early 30s, has considerably less voltage drop. In the present MOPA the type 83 was used in both power supplies, and the results were quite satisfactory. Solid state rectifiers can also be used. Voltage drop, under load will be even less than the type 83 tubes.

For the oscillator stage, try to assemble a supply that will produce a DC voltage of around 300 to 350 for a 210 or 45 tube. Use a power transformer with a 150 to 200 mA rating for low internal resistance. A single choke and capacitor filter will produce a fine T-8 signal. For those that have to have a pure T-9 note, add a second choke and filter capacitor. In either case use a husky choke with low resistance to minimize key down voltage drop. Filter capacitor values are not critical—whatever is available in the junk box. A heavy bleed of 15,000 to 17,000 ohms across the DC output is recommended. In the present MOPA the oscillator power supply produces a no load voltage of 340 volts. Key down voltage drop is 35 volts, acceptable for a chirp free note.

The power supply for the amplifier stage can be designed around any husky transformer that comes out of the junk box. For a type 210 tube, DC voltages up to 600 volts may be used. If the builder is using type 45 tubes in his MOPA, the plate voltage should be limited to about 400 volts.

A choke with a 150 to 200 mA rating is recommended, and again use a heavy bleed across the filter output. The use of oversize power transformers and chokes and 15,000 to 17,000 ohm bleeder resistors will all contribute to good voltage regulation. For those builders with minimal junk boxes, chokes and power transformers can be purchased from Fair Radio Sales Co.

A small bias pack is needed to provide grid bias voltage for the amplifier. A small power transformer and a solid state bridge rectifier for this unit can be purchased from Radio Shack.



Schematic for the MOPA rig at W1FPZ. See text for tube recommendations.

The bias pack should produce up to 75 volts for the 210, depending on the plate supply voltage.

Tune Up and Operation

For initial tune up and check, disconnect the coupling capacitor between the oscillator and the amplifier. Tune a receiver to the desired frequency in the 80 meter band. Switch power on and depress key. If the tuned circuit has been properly built, rotating the variable capacitor will bring the oscillator on to the receiver frequency. Key the oscillator to check for a clean, chirp free note in the receiver.

Couple the oscillator to the amplifier and apply filament and bias voltages to the amplifier tube. Neutralize the amplifier stage first. A milliammeter with a range of about 0-20 ma should be temporarily connected between the bias pack and the amplifier grid circuit to assist in neutralizing adjustments. Don't forget to disconnect the B+ lead from the power supply before attempting to neutralize. Precise neutralization is essential for a clean signal. Then apply the B+ voltage to the amplifier, key the oscillator, and quickly rotate the plate tuning for minimum plate current.

Now couple the amplifier output to the antenna tuner and load the amplifier to show the rated or desired plate current.

The type of antenna tuner, and the method of coupling the final tank, is a matter of personal choice. I use a Collins Pi-Net tuner which works very well. Output from the amplifier tank is coupled to the antenna tuner through two DC blocking capacitors and then with twisted pair to the tuner. The tuner couples to 600 ohm open feeders.

A simple series tuner can be made by winding 5 or 6 turns of ¼ inch copper tubing to the same diameter as the amplifier tank coil. The pickup coil is mounted at the "cold" end of the tank with some method of varying the coupling. Some early builders mounted one end of this coil on a beehive insulator so that the coil could be pivoted in and out.

If adjustments have been carefully made, a good T-9 signal should be generated. Good luck, and hope to hear you on one of the AWA contests. Please feel free to call or write, if I can be of further help.

(continued on page 39)

THE COMMUNICATIONS RECEIVER

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Please include SASE for reply.

A World War II German Military Communications Radio

By Thomas G. Willard, KB3SI

Some time ago, I was chatting with one of my neighboring amateurs, an AWA member, who mentioned that he had access to a unique German World War II communications set. I asked him to document whatever information he had on it, and in due course he sent it along. With other pressures, the article languished until I recently resurrected it and decided it would be a good candidate for this column, even though it is a combination receiver-transmitter. If any of our readers can provide additional information, I'd appreciate hearing from them. Our thanks to author Willard both for his efforts and his patience.
—W2DGB.

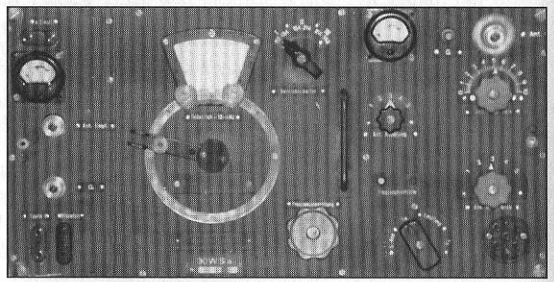
The radio set discussed in this article came to light during the auction of the estate of William Shimonek of Spring Brook Place near Delaware, New Jersey. At one time Spring Brook Place, which overlooks the Delaware River, had been a thriving resort hotel. But the hotel had not seen a guest for many years when Mr. Shimonek, well into his 80s, passed on. He had no direct heirs so the estate went to a friend to whom he had owed some money.

The successful bidders for the contents of the attic of the old hotel had to make quite a few trips down the steps to load all of the items into their van. When the attic was almost empty, the noticed some loose floor boards. When the last one had been pulled loose, they discovered the subject of this article hidden under the floor.

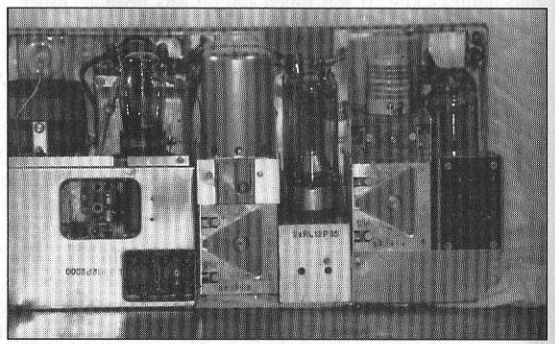
Mr. Shimonek had been in the army during the war and possibly had served overseas. He was active in the American Legion and knew many veterans that had served in the European Theater. He may have brought the radio back from Europe himself or acquired it from a friend.

The radio is a model 30W.S.a, serial number 02166-44. The last two digits of the serial number might indicate its year of manufacture. The tubes in the set also bear 1943 and 1944 manufacture dates. The 30W.S.a has three frequency ranges selected by a large bandswitch. Band I covers 1.12 to 1.54 MHz; band II covers 1.54 to 2.14 MHz; band III covers 2.14 to 3.00 MHz.

The tube complement consists of three Telefunken RL12P35s, two Valvo RL12P2000s, and one RL12T15 also manufactured by Valvo. The RL12P35 has a 5-pin brass base. It is about the size of a 203 but with two separate anode caps as can be seen in the photograph. Two of these tubes are located together on the chassis suggesting parallel circuitry. The RL12P2000 is the size of a T-5 1/2 button-base miniature, and has a 6 pin radial bakelite base and top cap. The RL12T15 has an ST-12 bulb with a 4 pin bakelite base. Both the RL12P35s and the RL12T15 use locking sockets.



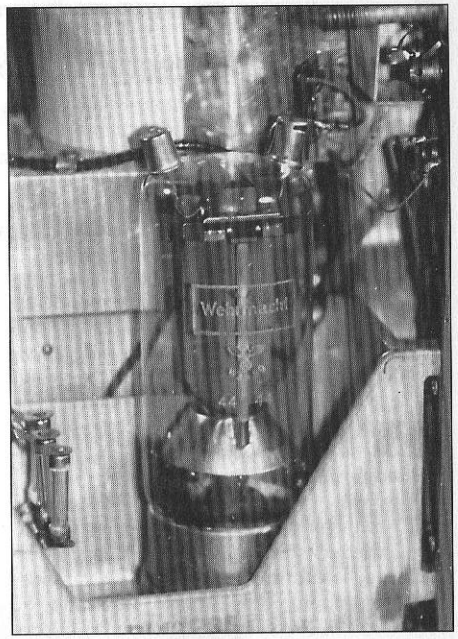
The front panel of the 30W.S.a has the no-nonsense layout typical of most military sets.



Rear view shows modular aluminum block construction (see text).

There are separate antenna connections for receiving and transmitting. The set was manually switched from the receive to transmit modes. Inputs are provided for "TASTE" which is the cw key input as well as "MIKROFON." Two ground connections are also provided on the front panel. A 6 pin power cable 18 inches long was found with the set, but no separate power supply was present. The cw key is enclosed in a small bakelite case with a threaded hole on the bottom. The headphone earpieces are inside sealed bakelite enclosures. The radio chassis slides into a metal case with a handle, and a steel panel cover locks on the front panel to protect the dials and switches. The weight of the set without the case and panel cover is 41 lbs.

The chassis is built up of machined blocks of solid aluminum which are bolted together. Polished aluminum panels cover virtually all wiring. The condition of the set is such that gloss of the polished aluminum panels is still as bright as the day they left the factory. German "Wehrmacht" markings are stamped on the set as well as printed on the tubes. The frequency range of the radio seems rather low for portable vehicular use since the size of the antennas would be quite large. Possibly the radio was designed for installation in a submarine but was never used. While all of the fuses (4) found in the set are open, there appears to be no damage to the set and no indication of alterations or repair.



Closeup of one of the RL12P35s shows Wehrmacht identification.

We will have to leave it to readers of the OTB to provide more information on this particular set. It is certainly a well-preserved example of German radio construction during the latter days of the second world war.

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"Forgotten" Pioneers of Wireless

By James P. Rybak

PART 1 — NATHAN STUBBLEFIELD

This is the first of author Rybak's projected series of articles on "forgotten" or unsung wireless pioneers. Working from a list of suggestions sent in by OTB *readers, Jim plans to follow this profile with similar ones of Mahlon Loomis, Fr. Murgas, Julius Lilienfeld and others. It's not too late to send in your own nominations and suggestions for this series! —MFE*

Credit for the first radiotelephony broadcast generally is given to Reginald Fessenden for his Christmas Eve transmission from Brant Rock, Massachusetts to the ships at sea in 1906. However, a number of people believe that Nathan B. Stubblefield deserves significant recognition for successful wireless telephone experiments which were begun at least 14 and, perhaps, as many as 21 years earlier. Unfortunately, many of the "facts" surrounding Stubblefield's work are unclear, in large part due to his almost hermit-like lifestyle and his unwillingness to trust others. The most extensive and reliable history of Stubblefield's activities was written by Thomas O. Morgan in 1971. (See "Recommended Reading" below.)

Stubblefield was born near Murray, Kentucky in 1860. As a teenager, he had intended to be a lawyer but, by the time he was twenty, he had become intrigued with the study of electricity. Nathan Stubblefield married at the age of 21 and settled down on a small farm near Murray. Neither his wife, his children, nor his neighbors found it easy to understand or get along with him. Of the six of his nine children who survived infancy, only one was permitted to attend public school. The others received their educations at home. Nathan Stubblefield was an "inventor" and feared that, if his children were around others, they might naively give away his "secrets."

A loaded shotgun at the front door brandished by an unwelcoming Nathan deterred all visitors from coming to the door of his house. The boundaries of the Stubblefield farm were rigged with wires and bells designed to sound an alarm if someone was foolhardy enough to try and trespass. The majority of the small income the farm produced was spent by Nathan on equipment for his "experiments." He in his family lived almost in poverty.

Nathan Stubblefield was moderately successful as an inventor. He obtained patents on a "lighting device" in 1885, a mechanical telephone in 1888, an "earth-cell" electrical battery in 1898, and on a wireless telephone in 1908. His mechanical telephone system had a range of only 5 miles, at most, but was sold commercially in the region from about 1887 to 1889 until the much better Bell electric telephone system was brought into the region. Stubblefield's earth-cell battery consisted of two electrodes buried in the ground with the earth serving as the electrolyte. While this earth-cell battery was able to power a small electrical motor continuously for two months, he never sold it commercially.

The date when Stubblefield began his development of a wireless telephone is not clear. An article published in the *St. Louis Post-Dispatch* dated January 12, 1902 and entitled "Kentucky Farmer Invents Wireless Telephone" quotes Stubblefield as saying "I have been working on this ten or twelve years...long before I heard of Marconi's efforts, or the efforts of others, to solve the problem of the transmission of messages through space without wires."

The inventor's first attempt to create a wireless telephone used large coils to generate induction fields. Meeting with little initial success, he then sought to use the same type of earth connections he had used successfully with his earth-cell battery.

The wireless telephone experiments prior to 1903 then became focused on generating a current by connecting a steel rod by wires to each end of a series connection of a carbon microphone and a battery. The rods were placed into the ground 20 to 30 feet apart to complete the circuit. The receiving circuit consisted of a telephone speaker connected by wires to two additional steel rods which were placed in the ground, also 20 to 30 feet apart, at a distant location. With this apparatus, Stubblefield was able to generate an audio frequency electrical signal which was propagated from the transmitter to the receiver by means of the conductivity of the ground.

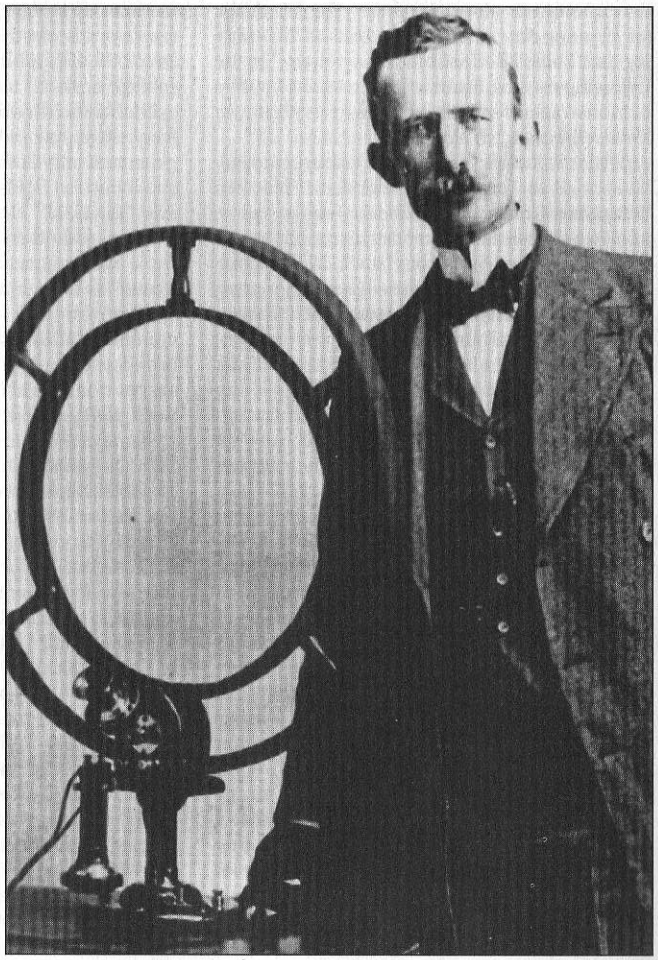
Stubblefield's first public demonstration of his wireless telephone took place in Murray, Kentucky in March of 1892. A receiving circuit in a box was placed about 250 feet away and was separated from the transmitting circuit box by a masonry wall. It was clear that no wires connected the two boxes. When Stubblefield talked into the first box, the witnesses reported that his voice came out of the second box "quite distinctly and clearly."

Two private demonstrations of his wireless telephone also were made by Stubblefield to friends in 1892. A witness to one of these private demonstrations later testified that the distance between the two boxes was "between 2000 and 3000 feet." Both demonstrations were made to credible witnesses who reported that they were able to hear Stubblefield's voice clearly. Another, less well substantiated report indicates that Stubblefield may have made a private, 200 yard, successful demonstration of his equipment to a friend as early as 1885.

In 1901 several unscrupulous New York "businessmen" organized the Wireless Telephone Company of America, ostensibly to market Stubblefield's invention for him. Part of their plan called for the inventor to conduct public demonstrations of his wireless telephone equipment in order to gain publicity. Stubblefield assigned to them the rights to his wireless telephone in exchange for 500,000 shares of stock in the Company.

On January 1, 1902, Stubblefield demonstrated his wireless telephone to a thousand people in the courthouse square in Murray. This time he set up five "listening stations" in various parts of town, the furthest being six blocks away. The witnesses reported hearing voices, as well as harmonica music, clearly.

Ten days later, Nathan Stubblefield gave an extensive private demonstration to a reporter from the *St. Louis Post-Dispatch*. The reporter was allowed to inspect the equipment and to position the equipment and the ground rods where he wished. During the course of the day, the reporter was able to clearly hear voice and harmonica sounds at distances ranging from 500 yards to approximately one mile.



Nathan Stubblefield with his inductive wireless telephone system. (From Murray State University Collection)

Probably Stubblefield's most spectacular demonstration occurred in Washington, D.C. in March of 1902 when he showed that his wireless telephone was not limited to land use. One of Stubblefield's receiving units with a total of three telephone speakers connected was put aboard a ship in the Potomac River to receive messages from the shore. A group of people, including a newspaper reporter, were aboard the steamer and intermittently, but "satisfactorily," heard voices from the shore-based telephone transmitter. The wires from the shipboard receiving unit were trailed in the water from the stern of the ship. Stubblefield believed that the reason for the intermittent reception was due to an inadequate battery powering the equipment on the ship.

Immediately following the shipboard tests, land-to-land demonstrations were conducted between locations along the shore. The *Washington Evening Star* described the tests as "interesting and, indeed, little short of marvelous." In the following months, Stubblefield conducted public demonstrations of his wireless telephone in Philadelphia and in New York.

While Stubblefield, himself, was scrupulously honest, all the organizers behind the Wireless Telephone Company of America really had in mind was to use these demonstrations as a means of enticing investors to buy stock in the Company. They had no intentions of actually setting up a wireless telephone system. When Nathan Stubblefield finally realized what was happening, he returned to Murray dejected and without money or equipment. The numerous people, many of them from Murray, who had bought stock in the Company, based on their belief in Stubblefield and his invention, lost their investments.

Beginning in 1903, Stubblefield again tried to develop a wireless telephone based on the generation of induction fields. He replaced the ground rods in his wireless telephone system with a very large coil of wire which remained above the ground at the sending and receiving units. In one demonstration made to family members, the coil at the sending unit was 40 feet in diameter and consisted of 42 turns of number 20 copper wire. The coil at the receiving station was 26 feet in diameter and consisted of 40 turns of number 28 wire. A battery made up of 48 dry cells provided the current necessary to create an induction field at the sending unit. With this arrangement, Stubblefield was able to generate an audio frequency induction field which propagated through the air to the receiving station located 423 yards away. No ground connections of any kind were used. No public demonstrations of this totally "above ground" system are recorded.

Stubblefield received a patent on this induction wireless telephone in 1908. In order to obtain the financial backing needed to obtain the patent, he again had to give up to others most of his financial interest. Attempts to market this wireless telephone system failed dismally because adequate capital could not be obtained.

Nathan Stubblefield went back to his farm bitter, disillusioned, and broke. He soon became even more eccentric and domineering. One by one, his children, and finally his wife, left him. He lost his farm and home to creditors. From 1917 he lived alone, his condition growing ever more destitute. Stubblefield refused the assistance of what few remaining friends he had. He died of starvation, alone in a dirt-floored shack, in 1928. Up to the end, however, he attempted to continue his electrical experiments using whatever bits of wire and other materials he could salvage or find.

Stubblefield's wireless telephones used audio frequency, not radio frequency, currents. He generated only audio frequency ground currents and induction fields. He likely did not propagate any "far-field" electromagnetic waves as did Marconi and others. The existence of these "far-field" waves is necessary if the term "radiotelephony" is to be applied appropriately. Stubblefield envisioned only short-range telephone communications, not long-distance wireless broadcasting. Nonetheless, Stubblefield deserves considerable credit for his pioneering work with wireless telephony.

Recommended Reading

1. Coleman, J. Winston, *Nathan B. Stubblefield - The Father of Radio*, Winburn Press, Lexington, KY, 1982.
2. Fawcett, Waldon, *"The Latest Advance in Wireless Telephony,"* Scientific American, May 31, 1902, pg. 383.
3. Horton, L.T., *"Murray, Kentucky, Birthplace of Radio,"* Kentucky Progress Magazine, March, 1930, pp. 20-22, 44-46.
4. Morgan, Thomas O., *The Contribution of Nathan B. Stubblefield to the Invention of Wireless Voice Communication,* Ph.D. Thesis, Florida State University, 1971.
5. Thomas, Edison H., *"The Real Father of Radio,"* The L. & N. Magazine, November 1964, pp. 10-11.
6. Watson, Thomas S., *"First Wireless,"* Lexington (KY) Herald-Leader, July 11, 1976, pg. E-4.

EQUIPMENT RESTORATION

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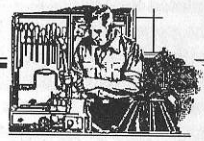

Mystery Tube Identified

Thanks to Jim Cross (Cincinnati, OH) for identifying the base monogram on my mystery tube (*OTB*, V. 37, No. 4) as that of the Shaw Insulator Co. Henry S. Shaw developed the molded Bakelite tube base during WWI. Later he was associated with Moorhead and DeForest in tube manufacture. He made bases for Arcturus and Majestic among others. Ed Rybak, W3QAG (Morristown, VT) reports that he has a Kellogg tube with the Shaw monogram and type number on the base. Now we know who made the base, but who made the tube? —DKO

♦ ♦ ♦ ♦

The following contribution is longer than usual, but it is valuable because it covers just about every restoration problem you could encounter.

Restoration of an RCA Model 9Y7

by David Ivarson, W3WBE (Collegeville, PA)

When this set was new, the latest neighborhood status symbol was a TV antenna on the roof, and the 45 RPM record had come upon the home entertainment scene. The RCA Model 9Y7 radio/record player in a beautiful red mahogany cabinet climaxed the golden age of radio at our house. It is a transition piece—one of the last wood cabinet table radios of this style and one of the first with a 45 RPM record changer. The Owner's Brochure was rolled up in the record changer compartment. The date code on the brochure indicates that the set was built around 1949. Of course, the brochure warns the owner to use only genuine RCA tubes!

After this set was retired from active service, it resided in an attic for about 17 years. Re-discovered during a household move, it became my garage radio. The plan was to discard it when it quit working, but it worked for another 14 years! By then the AWA had taught me that restoration was the right thing to do. What follows is a look inside the 9-Y-7 and a chronicle of the efforts that brought it back to life.

The chassis is located directly behind the speaker and has some unusual features. The tubes are a mixture of octal and miniature types: 12SA7 converter, 12SK7 I.F., 6AQ6 detector-audio, 6AQ6 phase inverter, and push-pull 35L6s in the output stage. The rectifier is selenium. Viewed from the front, the tuning condenser, filter cap and miniature tubes are on top of the chassis, and the four octal tubes and output transformer are mounted horizontally, projecting from the rear of the chassis.

The volume control on the left side of the front panel is at the core of a concentric arrangement with the drive gear for a 7-position function/tone switch. The volume control potentiometer is mounted in a separate enclosure on a bracket fixed to the chassis, while the tone switch is located within the chassis and is connected to its operator by a gear train.

There are pockets in both sides of the record player compartment to hold 45 RPM record albums. A flat-wound antenna coil (called a "Magic Loop" in the Owner's Brochure) is located on the inside right wall of the cabinet. At the front of the compartment, a cardboard cover hides the radio chassis and gives a somewhat finished appearance. The underside of the hinged lid is complete with a Nipper and "Victrola" decal.

The restoration was divided into several phases. First came the cleanup and cabinet repair. Aside from the usual dust, mouse droppings and a few scratches, the cabinet was structurally sound except for one diagonal foot brace that needed regluing.

Cabinet restoration presented a dilemma. After thorough scrubbing, some scratches were discovered in the extremely thin veneer along with areas around the knobs where the veneer was worn away. I had to choose between a complete veneer rebuild or a simpler cosmetic job. Since veneer work was beyond my ability, I sanded the exterior lightly and wiped it with mahogany stain. I treated the worn areas with a

heavier coat of stain. A couple of coats of varnish brought the cabinet back to a respectable appearance. A new piece of black grille cloth completed the job.

The rectangular brass dial bezel was a stubborn item. It was retained in the cabinet by eight small Tinnerman clips pushed on over the bezel mounting posts. I discovered that these clips lift off easily without damage to clip or post after inserting a straight pin under each wing of the clip. [Good tip, Ed.] The finish on the bezel was dark and cruddy, and it refused to succumb to lacquer thinner or other household chemicals. 400 grit paper, fine steel wool and polishing compound restored the original lustre. The Plexiglass slide rule dial was in surprisingly good condition with no serious scratches. It responded nicely to Novus cleaner and wax.

The next, perhaps easiest, phase was to bring the radio section back to life. After cleaning out more mouse droppings, I removed the speaker and scrubbed the chassis with detergent followed by a hot water rinse and a week-long drying on top of the furnace. *(See* OTB *Vol. 38, No. 1 about washing radios. Ed.)* The line cord was replaced first, as the original was cracked and showing bare copper. The power supply of the 9-Y-7 is the usual death-trap series heater and half-wave rectifier arrangement with the circuit common tied to the chassis through 220 kΩ and 0.05 µF. The metal tube shells and phonograph shields connect directly to the chassis.

Although the tube heaters were intact and the B+ appeared normal, the radio didn't play. On the bench I was able to make the radio work by touching any part of the circuit with a metal screwdriver. After that initial transient the radio would work until turned off for a while. Suspecting poor oscillator starting, I replaced the converter tube and that cured the problem. Some of the metal tubes had a picture of Nipper on them and might have been originals. It's also possible that drift in component values caused marginal operation. An ohmmeter check showed most of the carbon resistors had increased about 20% above their marked values.

A few other items needed attention: I replaced two of the wax-filled capacitors. One was close to a hot ballast resistor in the heater circuit and had lost some wax. The other had suffered a total meltdown, and only its end caps were attached to the circuit. Its carcass was found stuck to the bottom wood panel when the chassis was removed from the cabinet.

This capacitor is connected across the AC line after the on-off switch. Many schematics show a 0.01-0.05 µF capacitor at this location, and no one has been able to tell me the purpose of this capacitor. As far as I can tell, all it does is help to burn the switch contacts when the set is turned on, and radios seem to work fine without it. I did replace it just in case it is part of a deeper ritual that is beyond my understanding.

The tuning mechanism did not turn easily. Inspection showed the front tuning condenser ball bearing was dry. When lubricated, it worked like new.

The volume control was scratchy, as expected on a set this old, but I located a replacement of the same value with the necessary tap. It has a standard ¼ in. shaft, and the concentric drive gear for the tone switch rides on the threads of the volume control bushing—a clever arrangement that allows the use of standard size hardware.

The speaker was in good condition, but its gasket had disintegrated. I fashioned a new one from cork gasket material from the auto supply.

At this point the radio was working, but the audio didn't sound right. There was also an annoying random background static. The problem was isolated to the audio section. All of the grids were found to be slightly positive, caused by leaky coupling capacitors. These were replaced along with others in the circuit where there was voltage stress.

The random static noise persisted and was heard even with the output stage isolated. New filter capacitors in the power supply did not help. The culprit was a bad output transformer. Measurements showed one plate at about 90V and the other around 60V. Resistance measurements indicated shorted turns on one half of the primary winding. I found a replacement transformer with the same construction as the original and nearly the same size and mounting arrangement. With the new transformer, voltages were normal, the static was gone, and the audio sounded good.

To align or not to align? The set played well, so I chose not to monkey with it any further. The tuning is sharp all across the dial. There are no whistles, calibration is correct, and sensitivity is good. This is a very good AM radio - something not easily found these days. Its performance is superior to the present day radio-on-a-chip designs.

I saved the greatest challenge until last—getting the record player working. The turntable and motor were frozen, and most of the soft parts had returned to the dust from which they were made. The jacket on the umbilical cord from the muting switch to the radio chassis connector had a bad case of rigor mortis, and the turntable pad had taken on a nondescript shape of its own.

Restoring the cosmetic appearance of the record player was easy. The base paint was in good condition, and with the logo removed, some auto polish made it look like new. The arm, spindle/turntable and logo were re-gilded, and the appearance of the red plastic spindle dome was nicely restored with Novus plastic polish. A new turntable pad was made from adhesive backed felt.

After removing all soft parts, the sub-chassis was flushed with paint thinner to remove dirt and hardened lubricant. The motor was in good condition and simply needed cleaning and lubricating. Surprisingly, the motor mounts were also in good shape.

The stacking spindle mechanism has a pair of eccentric disks and cams that are gear driven by a concentric shaft arrangement up through the center of the spindle. These required special care in cleaning as their riveted construction did not allow removal of certain plastic parts. At this point, let me insert a plug for Victrola Repair Service of St. Johnsbury, VT, one of AWA's advertisers. They rebuilt the idler wheel and crystal pickup, both of which were in bad shape. Without these two critical components the project could not have been completed.

Following reassembly, only a few adjustments were needed to get the turntable mechanism working again. Having marked the position of the removable parts before disassembly, only slight readjustment was needed later. Two adjustments are accessible from the top of the chassis: the landing adjustment that drops the arm at the correct spot on the record, and the height adjustment that allows the arm to clear a stack of eight records. Procedures for making both of these adjustments are given in the Owner's Brochure.

At last the restoration was complete, and the chassis and record player were installed in the cabinet. On the rear of the cabinet a gold colored label proclaims, "This is to certify that this instrument includes the matched elements required in the production of Golden Throat tone," signed by the chief engineer of the Home Instrument Department of RCA Victor. The push-pull output stage and oval speaker in this set provide sound quality better than the ordinary table radio of this vintage.

According to the patent data label on the bottom panel, this set was made at the RCA plant in Camden, NJ. Its components bear "Made in U.S.A." markings. By contrast, most of the replacement parts used in restoration were made in other countries. On a recent trip through Camden, I saw the old RCA building. Nipper is still on the tower, but the adjacent annex stands abandoned with broken windows—a sad symbol of our present industrial status.

LONG HUNT FOR MUSEUM GIFTS

WASHINGTON.

It will take three years before the project for the establishment of a radio museum, housing notable exhibits of pre-broadcasting developements, actually will have assumed definition, said C. W Mitman. He is curator of mechanical technology of the Smithsonian Institution. Space has been allotted at the Institution for the museum

A survey of available material is being made by Governmental agencies, radio corporations and an unofficial committee.

As a nucleus for the collection, the Radio Corporation of America has offered its comprehensive collection of apparatus which it now displays at radio shows throughout the country. George H. Clark, historian of the RCA., is actively cooperating with the governmental committee, and will be a member of the official committee, the membership of which has not yet been completed.

Large amounts of this radio material, considered obsolete, and unfit for service, are stored in Government warehouses and will be disposed of as "junk' unless reclaimed by Federal action. In all parts of the Nation and in other countries, similar conditions exist, and expeditious action is required to preserve these materials before they are disposed of.

Moreover, declared Mr. Mitman, it is of utmost importance to obtain authentic records of radio developments while the individuals who participated in them are alive. Marconi, De Forest, Fassenden and others who actually introduced radio, are still active in the art, he said, and must be consulted in connection with the enterprise

Mr. Mitman said several years will be required before the enterprise shapes up. "By 1933 we hight have an indication of what we are driving for," he asserted.

In England a thorough search and investigation must be made if the collection is to be comprehensive, Mr. Mitman declared Radio actually had its inception there under Senator Marconi. Thus the "real, original material" should be in England.

The conferees decided to limit the collection up to the end of the World War period to exclude broadcasting.

From Radio World *1/11/30. Courtesy Alan Douglas.*

HEADSETS

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Adjustable Diaphragm Headsets

Collectors will find a number of early horn speakers, both open and enclosed, with adjustable drivers. Even Brandes produced an adjustable model. But headsets with adjustable diaphragms are much less frequently found. The term "adjustable diaphragm" is a bit misleading.

Wireless Specialty Apparatus adjustable diaphragm phones, circa 1910.

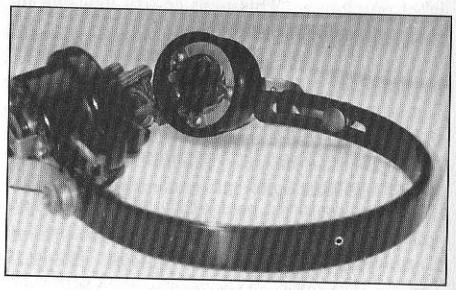
In these phones, the entire electromagnetic assembly is actually adjusted in relation to a fixed diaphragm. In spite of this, the correct nomenclature remains "adjustable diaphragm."

One of the earliest such sets manufactured in the U.S.A. was made by The Wireless Specialty Apparatus Company in Boston, Mass. The patent date on this set is October 11, 1910. It has a metal headband with a protective coating and black bakelite receivers. The DC resistance is 2000 ohms.

Large thumbscrews on each receiver adjust the air gap between the electromagnets and the diaphragm. The gap may be varied from zero to approximately .0375 over the range of adjustment provided. It is truly a vernier adjustment, as 41 turns of the thumbscrew are required to effect this small movement. By manipulating the screws, the operator could adjust the phones for maximum sensitivity to extremely weak signals, or for no overload on extremely strong signals.

S. G. Brown of England made a set of adjustable diaphragm phones that may be a bit more familiar to most collectors. They were regularly imported into the U.S. during the 1920s. The DC resistance was 4000 ohms, and the entire adjustment took only one turn of the knurled knob on the rear of each receiver. These sets have an early English patent number, 29833-10.

S.G. Brown adjustable diaphragm phones as imported from England during the 1920s.



Another view of the Wireless Specialty set. Thumbscrew can be seen at rear of earpiece at left; diaphragm and cap have been removed from right earpiece.

I have found only one true adjustable diaphragm set thus far. The diaphragm remains captive within the earcap, and the earcap is adjusted on the receiver case. Large lock rings are provided on each receiver case to ensure that the setting will not change.

Note on IBM Headsets

Finally, here's an update on the "mystery" IBM headsets discussed in the August, 1996 column. Some time in the 1930s, IBM started to manufacture language translation systems. One notable use of these systems was during the Nuremberg war trials at the end of WW 2. The IBM phones pictured in last August's column were definitely used during these trials. I would appreciate hearing from any former IBM employees who may have worked on language translation systems. Of course, as always, correspondence involving any issue related to headphones is always welcome.

BROWN'S "A" TYPE SINGLE EAR PIECES.

Are of the well-known adjustable type, and are specially suitable for constructors making their own loud speakers, etc

No. RH2/10	60 ohms	..	each	£1	2	6
..	1000	..	..	1	2	6
..	2000	..	..	1	2	6
..	4000	..	..	1	5	0

The S.G. Brown earpieces were sold separately for use as speaker drivers. Catalogue illustration clearly shows thumbscrew adjustment.

***THE MOPA REVISITED**, continued from page 29*

Coils for the MOPA

There are a number of different coil configurations that may be used in the MOPA, depending on material from the junk box and/or individual preferences. The specs given below are just one solution. The coils are horizontally mounted on porcelain standoff insulators using banana plugs and jacks. Small lengths of PVC tubing may be used for coil forms.

Oscillator Coil

80 M 1¾" dia., 14 turns spaced 3", ⅛" copper tubing or No. 12 wire

160 M 2¾" dia., 18 turns spaced 3", No. 12 wire

Amplifier Coil

80 M 3" dia., 26 turns spaced 5½", ⅛" copper tubing or No. #12 wire

160 M 2¾" dia., 34 turns spaced 5½", No. 12 wire

Note: An excellent alternative amplifier coil form for 80 M is the old National XR-10A form, if available from the junk box or flea market. Use 20 turns No. 10 wire. The heavy sizes of wire, No.'s 10 and 12, may be purchased at any electric motor rebuild shop.

If you are a bit hesitant to wind your own coils, I would be willing to wind a few for the cost of materials and postage.

"Period Type" R.F. Chokes

A 3" long winding of #26 or 28 DSC wire on a 4" length of black ½" dia. Delrin rod will make a good oscillator plate choke.

For the amplifier plate choke, use a ⅝" dia. Delrin rod 4½" long and make a 3-4" long winding of #26 or 28 DSC.

If you can't find any of the old green DSC wire, a nylon covered wire, or enamel wire will work.

The grid circuit RF chokes in this particular MOPA use old 1928-1930 receiver chokes. Marshall Etter, W2ER, has a small supply for those builders desiring "period authenticity." More modern 2.5 mh chokes will work just as well.

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TELEVISION

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Transatlantic Television in 1928

By Ray Herbert

Editor's note: Alan Carter, a long time member of the AWA, kindly provided this article which was originally published in Television: Journal of the Royal Television Society, *in the January/February 1988 issue. Alan is a close friend of the author, Ray Herbert, who is a leading authority on the earliest days of television development. In addition, Alan was associated with other individuals involved with the 1928 transoceanic telecast. Both Ben Clapp, Chief Engineer for Baird, and Robert Hart, amateur operator at the receiving station, died in 1990.*

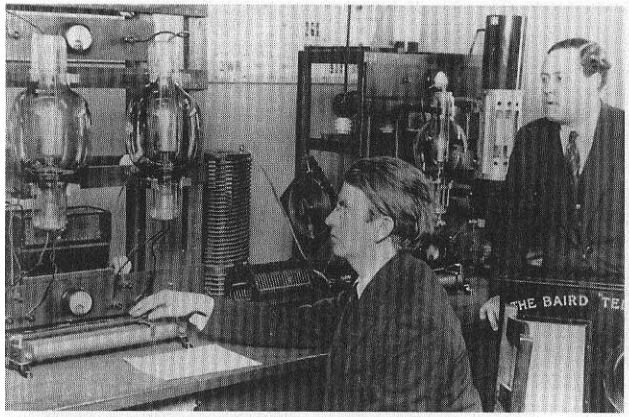
Just 60 years ago, in February 1928, live television pictures were transmitted across the Atlantic for the first time. They originated from the Baird Long Acre laboratories in London and were sent by Post Office telephone lines to an amateur radio station 2KZ, built by Ben Clapp and installed in the spare bedroom of his home in Warwick Road, Coulsdon, Surrey. It was quite an achievement and as the *New York Times* put it in their edition for 11 February 1928, 'His (Baird's) success deserves to rank with Marconi's sending of the letter 'S' across the Atlantic.' Two people who figured prominently in this notable event were Fellows of the Society. Ben Clapp is now 93 and William Fox died in October 1987, aged 98. Ray Herbert provides this account...

Baird was determined to keep ahead in the television race and the Atlantic represented a challenge to him as it had been also to Marconi. Fortunately, suitable equipment did not present a problem as his Chief Engineer, Ben Clapp, owned a powerful short wave transmitter originally intended for experimental broadcasts to Wanamaker's store in New York. Press comment appeared well in advance of the actual event and the *New York Herald Tribune* in July 1927, carried the headline 'Transatlantic Television Soon Possible'.

Radio propagation conditions would not have been favorable during the summer months and Ben Clapp did not in fact arrive in New York with the receiving equipment until 5 October. He stayed at the home of a radio amateur, Robert Hart, who had offered the use of his premises at Hartsdale for the experiments.

Meanwhile, the Coulsdon transmitter was operated by Harold Smith (the Best Man at his wedding) and Len Luger from the Marconi station at Croydon Aerodrome. Gwen Clapp, always a staunch and enthusiastic supporter of her husband's radio activities, looked after the station schedules, organized messages and provided countless cups of tea throughout the long nights. In December she travelled to New York and assisted in preparing for the demonstrations.

Ben Clapp at the window of his radio room, Coulsdon, 1927.



J.L. Baird (sitting) and Ben Clapp at Clapp's amateur station, G2KZ, which was used to transmit television pictures to New York in February, 1928.

During the winter of 1927-8, testing continued about three times a week on wavelengths of 90 and 45 meters. Vision signals were sent when available and at other times gramophone records were used. A medley from *The Desert Song* became established as a test piece.

W.C. Fox, Baird's journalist friend, aptly described the lengthy testing activities in *The Times* house journal:

For weeks, having finished my subediting turn on PA General Service at midnight, I went along to Baird's new laboratories in Long Acre over a garage, and waited about until 4am imbibing sundry sandwiches and beer, a most unsatisfactory diet after 2am, to kill the time. And for weeks the results were always the same — "no reply", "fading", "distortion", "no reception", "breakdown" (of one sort or another) and gradually all the enthusiasts who waited, eagerly at first, faded away until at the end of January, 1928, only myself and a photographer were left.

Faces Across the Sea

In February Baird judged that the results were suitable for a demonstration. Radio propagation conditions are as unpredictable as the British climate and the first test arranged for the night of 7-8 February proved to be fruitless. The following evening at around 19.00 New York time (midnight in London) Robert Hart, operating his receiver in the radio room on the second floor, announced over the link to London on 37.5 meters that the 'vision sound,' the unmistakable pulsating audio note of 30-line transmissions, was coming over.

In the cellar below, O.G. Hutchinson, Joint Managing Director of the Baird Company, Ben Clapp and a reporter from Associated press sat before the Televisor and watched the flickering, orange-pink screen resolve into a smudgy picture.

The first image to appear was that of Stooky Bill, a ventriloquist's dummy. John Baird came over next but the reception was marred by interference. William Fox followed with Mia Howe, the wife of the Associated Press representative in London, concluding the transmission at about

W.C. Fox, a journalist friend of Clapp's, being televised across the Atlantic from the Baird studios in Long Acre (February, 1928).

Ben Clapp (center) and author Ray Herbert (right) in 1990. At left, Tony Bridgewater.

23.40 (04.30 GMT). Those watching felt that it would not have been possible to identify the sitters. The results were admittedly crude but little better could be expected bearing in mind the equipment available and the inevitable degradation of the signal due to fading, phase distortion and interference. They were certainly no cruder than Marconi's three scratchy dots comprising the letter 'S' which had traversed a similar path 27 years earlier.

So after months of painstaking effort, television had bridged the Atlantic, less than six years after the first broadcast from 2LO and some four years before the BBC started their short wave Empire transmissions. The North American newspapers did full justice to the occasion, describing the events of the previous evening with front page headlines.

In contrast the British press coverage was meagre and even *Wireless World* could manage no more than three sentences. This apathetic response produced the following comment from the Editor of *Television*:

> *It is regrettable that so many people in this country should find it necessary to rush into print either to "damn with faint praise" or to adversely criticize and belittle the pioneer work of Mr. J. L. Baird. It is refreshing, therefore, to read the whole-hearted admiration of the American Press, some extracts from which we reproduce below. Truly "A prophet hath no honor in his own country."*

Some people would say that little has changed.

Reception in Mid-Atlantic

O.G. Hutchinson and the Clapps left for the UK on 2 March 1928, travelling on the *SS Berengaria*. Shortly before sailing arrangements had been made to attempt the reception of television pictures during the voyage. The ship's officers responded with enthusiasm and on the evening of 6 March (01.00 7 March in London) the vacant grin of Stooky Bill was seen for about an hour while technical adjustments were made. Stooky was used on these occasions as a tuning signal because human flesh could not withstand the intense heat from the studio floodlights for more than a short period.

Baird had asked Dora Selvey, the fiancee of the *Berengaria*'s Chief Radio Operator, Stanley Brown, to be present in the Long Acre studio and he was able to recognize her by the characteristic way she had of arranging her hair. 'Radio operator recognizes his betrothed on screen' proclaimed *The Evening World* the following day.

In the Jamaica district of New York, two radio amateurs, Boyd Phelps and Werner Olpe, successfully recorded the vision signals of Miss Selvey on a 78rpm phonograph disc but they had to enlist the help of a piano tuner. As the *Brooklyn Daily News* explained:

> *The pair, with the aid of a piano tuner who was called out of bed to bring his tuning fork to Phelps' house, successfully received the picture and recorded it on a phonograph disc. It was necessary that they work fast to measure the frequency and other variations so as to put their receiver at the same speed as that of the transmitter, for they had no way of knowing what speed the London transmitter (scanner) was worked.*

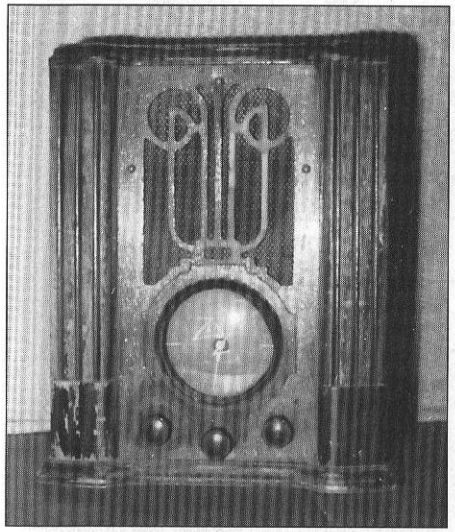
The Equipment

Ben Clapp built the equipment used for reception in New York and it appeared to be the forerunner of Televisor Model B, otherwise known as the 'Noah's Ark.' It consisted of a Nipkow disc driven by a 12 volt DC motor and a lens system that magnified the small picture obtained from the flat plate neon lamp. There were no synchronizing arrangements and the image had to be held in place by means of a low value variable resistor used as a fine speed control.

(continued on page 50)

Converting a Zenith 4V31 to AC Power

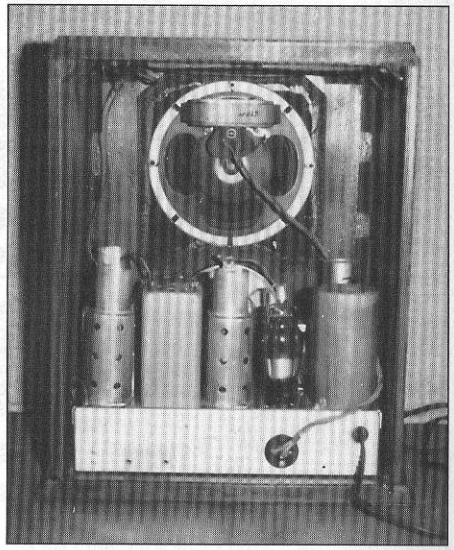
By Anthony Jacobi



The 4V31 as found. Most of the grill veneer was missing.

In this article author Jacobi has converted a Zenith 4V31 6-volt farm set to AC operation while closely maintaining the original appearance of the chassis. Not everyone will agree with this type of adaptation, but Tony presents his case for making such a change in the introduction below. The conversion suggestions are written as if the reader were working on an identical model. However, the methods used are readily transferable to similar sets. Maybe even to that little Monkey Ward table model I once bought with an AC plug and cord spliced onto the battery leads. —MFE

During the 1930s through the early 1950s, many so called "Farm Radios" were produced to accommodate customers who did not have access to AC line power. One of the more popular of these was the Zenith 4V31, an attractive small tombstone receiver that used a vibrator pack and a 6V wet cell battery. Apparently, no AC version of this model was produced, so it is a good candidate to be converted



Left: After repair and refinishing, the cabinet is in showroom condition. Right: Rear view of the radio shows little change except for the AC cord emerging from the grommet that formerly protected the battery cable.

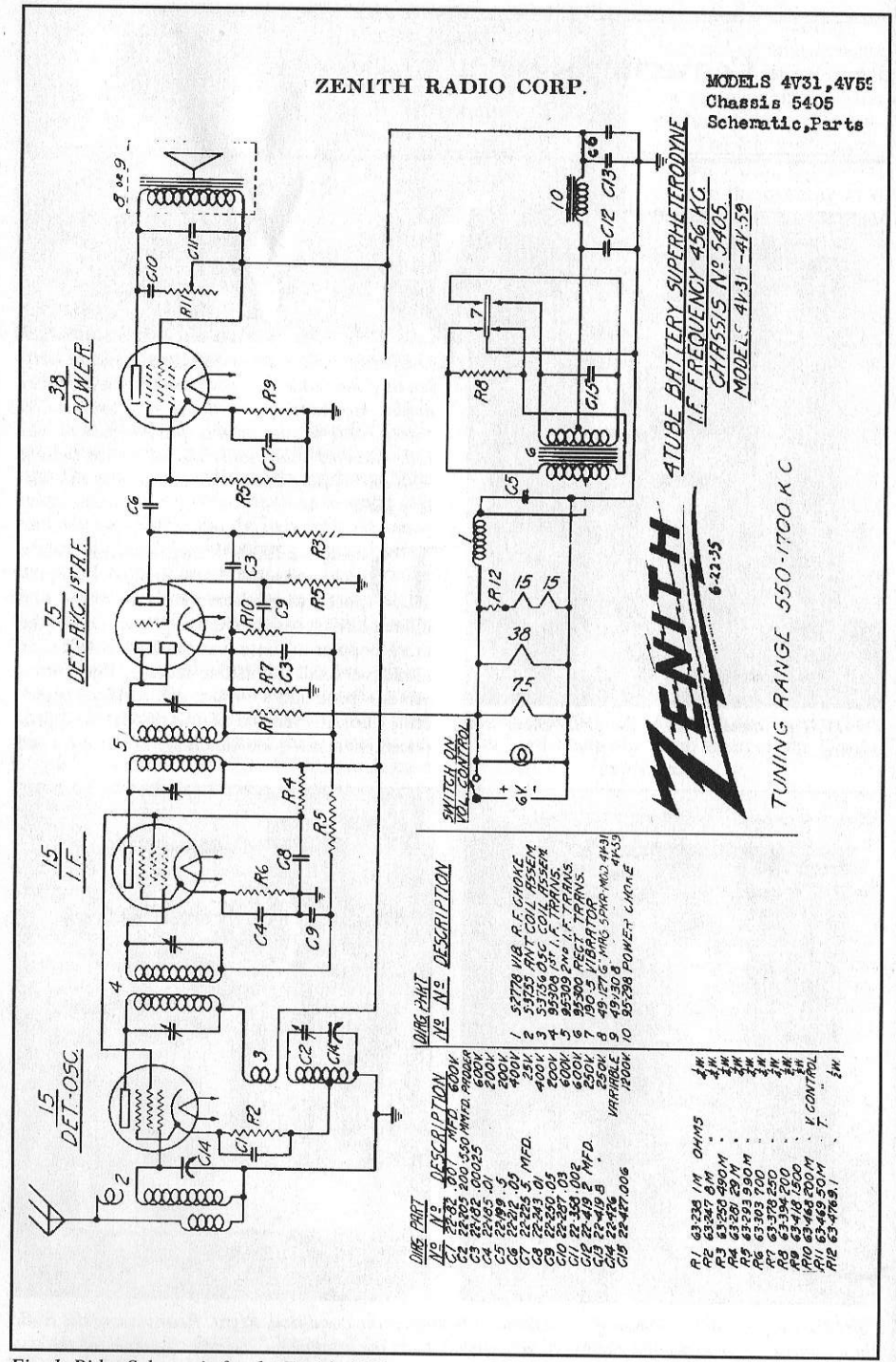


Fig. 1. Rider Schematic for the Zenith 4V31.

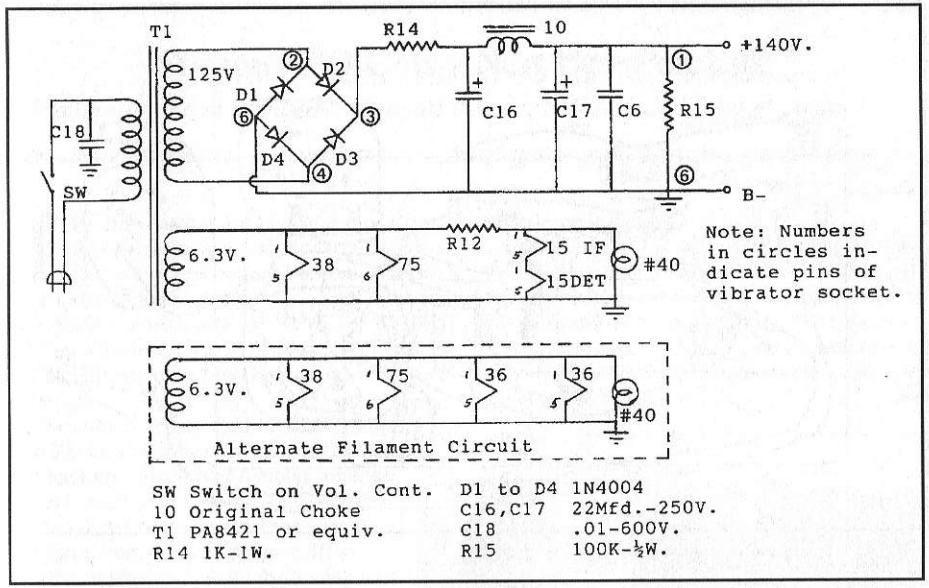


Fig. 2. Revised power supply turns the 4V31 into an AC model.

to AC operation.

Certainly, the easiest way to power-up any vibrator type set is simply to add a heavy duty DC power supply and run it on that. To me, vibrators in their day were fine, but now are difficult to find, noisy, or just plain cranky to use. So, I prefer to replace the vibrator power supply section with a nice quiet AC type. In many cases, these changes can be made under the chassis, or in the vibrator supply compartment, so that the outward appearance is unchanged—except getting rid of those heavy battery cables and clamps. But not always. In the case of our 4V31, there is not much chassis depth, so the new power transformer will have to be mounted on top in place of the present one. All other changes are underneath.

This set is a simple four-tube superhet using a modified autodyne detector-oscillator circuit (see Fig. 1). Fortunately, all the tubes are of the separate cathode type, so we can use AC on the filaments. Note particularly that it uses two type 15 tubes, which have 2 volt filaments, and a 75 and 38 which have 6.3 volt filaments. Treat those type 15 tubes very carefully as they are now in the S & E category (that's SCARCE & EXPENSIVE). Be especially careful when removing the grid caps from any of the tubes. The connectors used fit very tightly, and it is easy to break the tube top when trying to remove them. The deep design of the tube shields doesn't make it any easier either.

Before doing any conversion work, it is nice to have the set in possible operating condition. This would include having it clean and equipped with reasonably good tubes. Also replace all the tubular coupling and bypass capacitors, except those in the vibrator power supply section. Leave the square molded types for now as they are probably ok. Since this set uses the old dogbone style resistors, check each of those. Such resistors have a tendency to increase in value with age. Replace any that are more than 20% from color-code value. Remove the vibrator and replace the cover shield for appearance's sake.

Now remove the heavy battery cables, keeping the grommet in the chassis hole. You will need a heavy duty soldering iron for any solder work on the chassis. Keep the black wire, connected to pin 6 of the vibrator socket, in place and connected to chassis ground. Next, remove all parts of the vibrator power section, (except filter-can C12 and C13), including the transformer and choke. Do not damage the filter choke as it will be reused. If the original can-type filter capacitor C12,13 is still there, clip off the leads to it but leave it in place. Use care in removing the wires from the vibrator socket terminals, as those terminals may be used as tie-points later on.

One thing nice about farm type radios is that the designers kept the power requirements as low as possible to conserve batteries. So, using the original tube line-up and dial bulb, this set re-

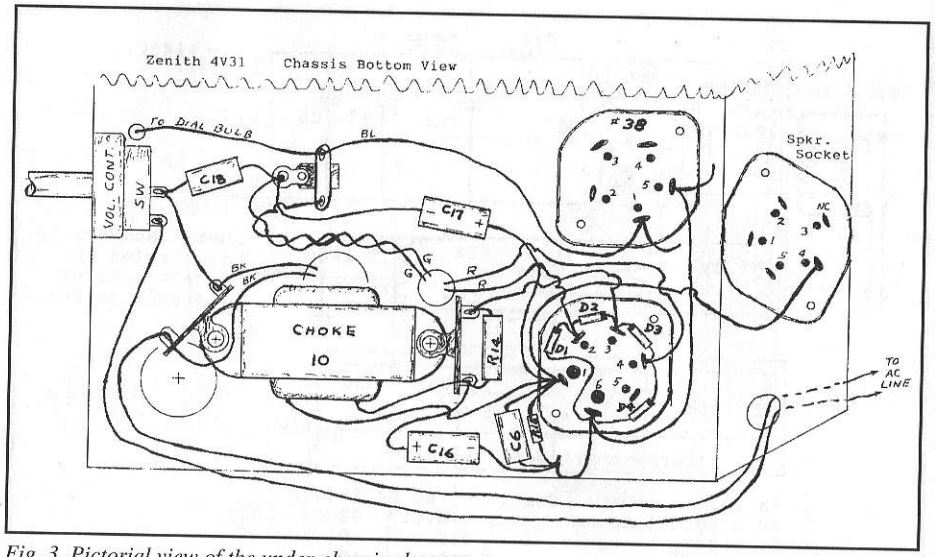


Fig. 3. Pictorial view of the under-chassis changes.

quires 6 volts at 1 A for filaments and 140 volts at about 12 mA for B+ voltage. I know the service data shows over 150 volts used—but those type 15 tubes are rated at 135 volts max., and I don't care to push them too hard. The 75 and 38 are rated higher, so no problem there.

Choose a power transformer that has at least a 2 ampere rating at 6.3 volts and a relatively low HV winding. A 400- or 500-volt center-tapped unit could be used at full-wave with an adequate dropping resistor. Also, using two filament transformers in a "back-to-back" set-up will work. The transformer I used was a Stancor PA-8421, which has secondaries of 6.3 volts at 2A and 125 volts at 50 mA. Refer to Fig. 2 for the circuit used, and Fig. 3 for the revised parts placement under the chassis.

With all the old power supply removed, mount the new power transformer next, using existing holes where possible. Some additional holes may have to be drilled for mounting, or to route wires through the chassis. Then re-mount the filter choke. Conventional wiring practice should be used, connecting the line cord to the primary through the volume control switch. Use additional terminal stand-offs where necessary. One of the 6.3 volt filament leads connects to chassis ground. The other may be connected to the stand-off tie-point located near the volume control. The blue filament lead from pin 1 of the type 38 socket and the lead from the dial light are then also connected to this tie-point. The dial-light lead will have to be lengthened about 2 inches to keep it clear of the tuning capacitor.

The high voltage section of Fig. 2 may be wired in at your discretion. I used the vibrator socket terminals to mount the diodes, along with some other components. Resistor R14 was mounted on a 2 terminal stand-off to make it easy to change if necessary to get the correct 140-volt B+.

After all rewiring is done and double checked, plug in the speaker and it's time to turn it on. After a short warm-up, check the B+ voltage. If it is not about 140 volts, change the value of resistor R-14 to obtain that value. It is also prudent to check the filament AC voltage. With today's higher line voltage, the transformer you are using may put out more than the rated 6.3 volts. If so, a low-value 5 watt resistor placed in series with the filament string will help. Usually 1 or 2 ohms is sufficient in this set, and the tubes will appreciate that.

Looking at both Rider's and Zenith's schematics on this set, you will notice they show a 250 ohm resistor R7 connected to ground and a 1K ohm resistor Rl connected to the Positive 6 volt line from the cathode of the 75. Apparently changes were made later, as my set has R7 changed to 1000 ohms, and Rl changed to 100K ohms, with the bottom connection moved to the B+ line. This circuitry is evidently used for bias stabilization, and is common in vibrator type sets.

After the voltages are correct, and the set is in working condition, the last thing needed is to align it. Follow the manufacturer's instructions on this. This set also has a tendency to howl or

(continued on page 66)

Station SAQ Gets a New Lease on Life

From information supplied by Lennart Benson, SM6JJX, and John M. Anderson.

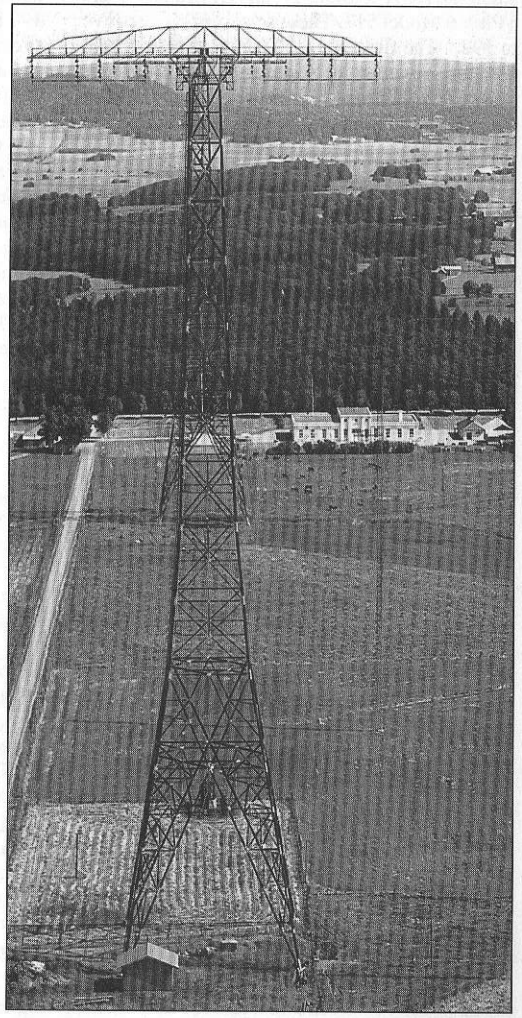
The famous low-frequency radio station SAQ at Grimeton near Varberg, Sweden, has now been declared a National Historic Landmark and will be preserved for the future. SAQ was officially opened on July 2, 1925 by King Gustav V, and was an important link in the global network of the Radio Corporation of America.

The station operated on 17.2 kHz using two 200 kw Alexanderson alternators (one for backup). Its six 127-meter antenna towers, each with a 46-meter crossbar at the top, have been a prominent feature of the Grimeton skyline for over 70 years. But the site had fallen into disuse and was in danger of being razed.

Thanks, however, to the lobbying efforts of a large group of people, Grimeton will be saved for the future. Funds contributed by the Swedish Government and the site owner, Telia Mobitel, are making it possible to restore the towers, beginning with those needing the most attention. This year, for the first time since 1924, one of the towers has been sandblasted and repainted. The entire tower had to be shrouded to contain the dust from the lead-based paint.

Remarkably enough, in the name of authenticity and durability, the repainting was also done using lead-based products. An extensive monitoring program was in operation as long as the work was in progress; this included analysis of blood samples from the workers and air samples from the surrounding countryside. It is estimated that the new paint job will last about thirty years. The project required over 1300 liters of paint (five separate coats), and costed out at about 6 million Swedish kronor (about a million US dollars). An additional tower will be repainted each year until all six are completed, and it is hoped that costs will go down as more experience is gained.

Station SAQ is the last of the big Alexanderson alternator stations in the world today. Still in working condition, it was on the air on September 6, 1995 as part of the "100 Years of Radio" ceremonies. Now we are assured that its voice will be heard on similar special occasions for many years to come!



One of the six Grimeton towers with another barely visible behind it. The old alternator building is at the right in the middle ground. Photos courtesy Lennart Benson.

Pitting The AK 40 Against Its Competition

By D.K. Owens

During Ralph Williams' Atwater Kent presentation at the 1996 AWA Conference, someone asked how AK receivers performed compared to competitive sets. This was a good question deserving an answer, but nobody at the meeting had one. My curiosity was aroused, so I decided to find out.

I chose three receivers from my collection for study: an RCA Radiola 17, an AK Model 40 and a Philco Model 511. These sets were competitive in 1928. The first two are TRF models with grid damping resistors to suppress oscillation. The Philco is a Neutrodyne. All use magnetic speakers. The advertised prices below show that the Atwater Kent was much cheaper than the others. Was it as good?

AK 40	($77)	+	E2 Speaker	($20)	=	$97
Radiola 17	($130)	+	100A Speaker	($20)	=	$159
Philco 511	($115)	+	211 Speaker	($25)	=	$140

The Experiment

The circuits of the AK 40 and Radiola 17 are virtually identical except for the antenna input to the first, untuned stage as shown in Fig. 1. The Radiola 17 uses a simple potentiometer, and the AK 40 uses a tapped coil called an "antenna coupling transformer" shunted by a potentiometer. Both potentiometers serve as the volume controls. This "transformer" is a flat, pancake coil mounted against the chassis beneath the first tuning capacitor. Ignore the points X,Y and the dotted line for now. The Philco is a neutrodyne with a tuned first stage. It also uses a potentiometer in the antenna input for volume control.

All three sets had been restored by replacing filter and bypass capacitors as well as out-of-tolerance carbon resistors where necessary. All RF and AF transformers were original. Alignment and neutralization were performed according to published instructions (Refs. 1, 2). The Radiola 17 has no adjustments of any kind.

The only information on Atwater Kent performance seems to have been published by Ralph Williams many years ago (Ref. 3). He found the sensitivity of the AK 40 to be better than 300 µV over its entire range with a pronounced peak between 900 and 1100 kHz. In his test, Williams determined the RF input required to produce 20V output across the speaker, judging that to be a good listening level.

I chose not to use speaker voltage as the only standard for comparing the three radios because, though a good measure of overall performance, it would mask differences in audio gain among the receivers. These differences are considerable. Audio gain was measured by injecting a 400 Hz sine wave at the detector plate and measuring the voltage across the speaker. The AK 40 has an audio gain from detector plate to speaker of 100; the Philco, 150; and the Radiola 17, 200.

Sensitivity measurements were therefore run two ways: (1) on the basis of the signal input required to give 20V audio on the speaker (overall performance) and (2) on the basis of the signal input required to give 0.2V audio at the detector plate (RF performance). The second condition eliminates audio gain differences among the receivers.

The signal source was a crystal-controlled generator, with calibrated output, of my own design. Modulation was 30%, 400 Hz, sine wave. To present the receiver with realistic input conditions, a dummy long wire antenna constructed per Fig. 2 was inserted between the generator and receiver. Audio voltages were measured with a Ballantine 300G AC VTVM.

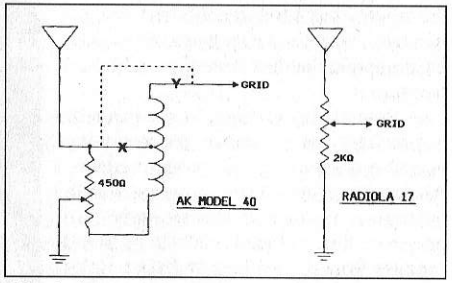


Fig. 1. Antenna input circuits of AK 40 and Radiola 17. See text for discussion of experimental wiring change at X-Y.

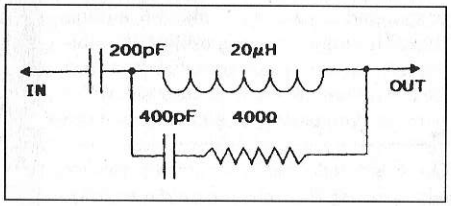


Fig. 2. Dummy long-wire antenna used to couple signal generator to receivers.

The signal source was set to a low level and the receiver carefully tuned to the test frequency for maximum voltage reading. Receiver volume controls were set at maximum. The generator output voltages required to register 20V on the speaker and 0.2V at the detector plate were noted. The Philco 511 has a front panel antenna trimmer which was adjusted for maximum response at each test frequency.

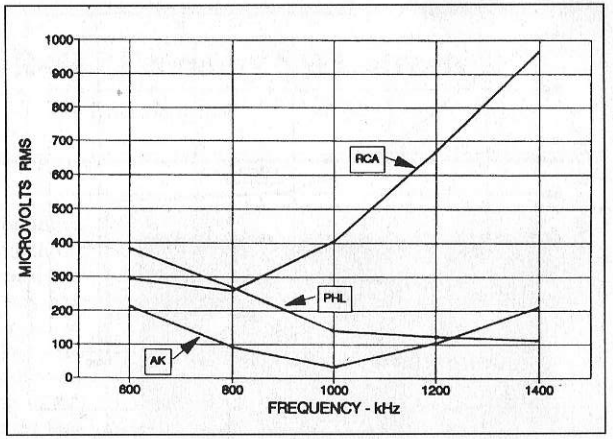


Fig. 3. R.F. sensitivity compared (signal strength required to produce 0.2V of audio at detector plate plotted against frequency).

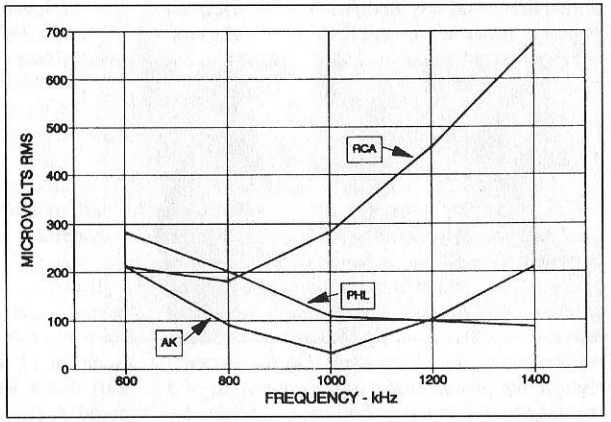


Fig. 4. Overall performance compared (signal strength required to produce 20V of audio at the speaker plotted against frequency).

The Results

Fig. 3 shows the RF performance of the 3 sets. The signal input required to give 0.2V audio at the detector plate is plotted on the Y axis. Remember that less is better in these graphs. Note first the strikingly poor performance of the Radiola 17 and the remarkably good performance of the AK 40. The sensitivity of the AK 40 is 200 µV or better at all frequencies. The Philco neutrodyne is better only above 1200 kHz. Its performance is disappointing. With a tuned front end, I had expected it to have better sensitivity than it does.

The overall performance comparisons (based on 20V audio at the speaker) are shown in Fig. 4. Having twice the audio gain, the performance of the Radiola 17 is improved under these conditions, but still poor. Philco's ranking is unchanged. The sensitivity peak of the AK 40 observed at about 1000 kHz by Williams is also evident in these results.

The sensitivity differences among the sets are not readily apparent to the ear when listening to actual stations; all have plenty of reserve volume. But there is a conspicuous difference in noise level. The Radiola 17, in a wood cabinet with poorly shielded circuitry, is quite sensitive to random electrical noises whereas the AK and Philco with metal cabinets are very quiet.

How can we explain the surprisingly good performance of the AK 40? Williams speculated that it might be due to regeneration, but went no further. The coupling coil of the AK 40 is mounted close to the first tuning capacitor, which is in the input to the next stage. The coil is probably self-resonant somewhere in the broadcast band. With close-coupled resonant elements in both the input and output of the stage, there is ample opportunity for regeneration by feedback through the grid-plate capacitance of the tube.

This possibility was investigated by altering the input circuit as shown in Fig. 1. Without disassembling the set, it was easy to unsolder the 2

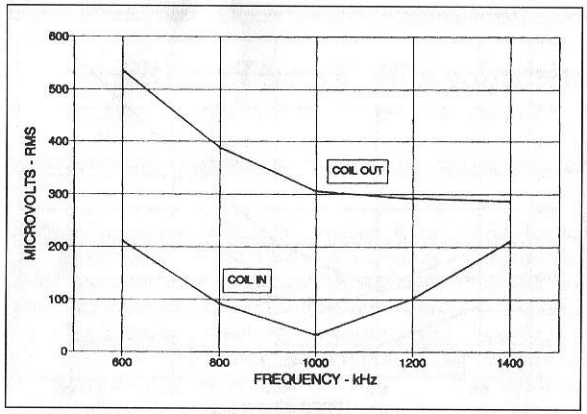


Fig. 5. Performance of AK 40 with and without coupling coil.

wires to the coil at points X & Y and tack them together to form the connection shown in the dotted line. With this modification, the AK input is purely resistive like the Radiola 17. The sensitivity test was then repeated with the result shown in Fig. 5.

Without the coil, the AK performance is much worse and does not show the sensitivity peak. It is still better than the Radiola 17 at frequencies above about 900 kHz. This result supports Williams' surmise that regeneration is responsible for the good performance.

Was this set deliberately designed to regenerate or was it accidental? We may never know, but buyers of the AK 40 certainly got their money's worth.

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1. *Radio Service Manual* (Philadelphia: Atwater Kent Mfg. Co., 1928).
2. John F. Rider, *Aligning Philco Receivers*, Vol. I (New York: Rider Publishing Co., 1937).
3. Ralph Williams, *Radio Age*, Vol.8, No.5 (May 1982).

TELEVISION, *continued from page 42*

The television transmitter (2KZ) at Coulsdon operated on a wavelength of 45 meters for the demonstration. It had a power of 2kW—far in excess of that which could normally be used by amateur radio stations. The two 1kW modulator valves specially made by Mullard can be seen on the left of the photograph. On the extreme right is the power output stage consisting of a triode mounted in a paxolin tube and cooled by a small fan at the base. Lead-acid batteries provided power for the filaments and two Mortley Sprague generators driven by a 9hp motor delivered 6,000 volts for the main high tension supply. In the garden a pair of 60 ft. masts, supplied by Corbetts the boat builders at Greenwich, supported the five-wire cage aerial.

Little is known about the studio scanner at Long Acre other than this description provided by Mia Howe for *Associated Press*:

In front of me was a black wall with about a foot and a half square opening. This was what might be called the lens. It was like a great wheel going round and round. It causes a succession of images of the object in front. Then a slotted disc revolving at about 2000 rpm interrupts the light reflected from the image causing it to reach the light sensitive cell in a series of flashes. Before reaching the cell the light passes through a rotating spiral slot giving a further subdivision of the image.

It would seem from this description that the basic optical arrangement closely followed that shown in the *Illustrated London News* in their issue for 11 September 1926. Dinsdale's book *Television* mentions that the monitor screen could provide a full size image of a person's head without a magnifying lens, so that would put the disc at about 5-6ft diameter.

Apart from the volunteers whose contributions have already been described, mention must be made of J.J. Denton, the modest Hon. Secretary of the Television Society during that period. He spent a great deal of time at the Long Acre laboratories assisting Baird in a variety of ways.

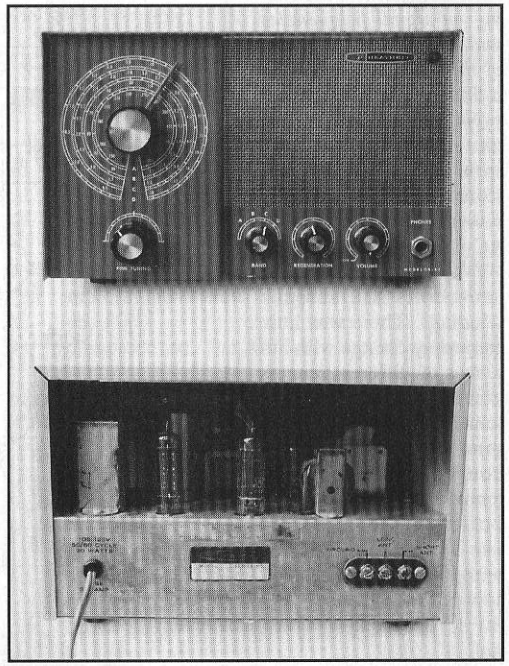
The Baird Company received little support from industry and no government grants were available to them. On this important enterprise, which put this country firmly in the forefront of television progress, Baird and his dedicated staff were on their own—all six of them.

Acknowledgement

The author would like to thank Ben Clapp for providing press cuttings and documents and the Glasgow Herald *for permission to reproduce their photograph of the Coulsdon transmitter.*

The Heathkit GR-81 "Economy SWL Receiver"

By Dick Strippel



Some three generations of budding hams and SWLs cut their teeth on vacuum-tube regenerative receivers built from kits. For minimum money and building time, these sets provided a simple and fun means to explore short wave radio. Despite a simplicity of design, their over-all performance could be outstanding in the hands of a skilled operator, exceeding that of simple superhets such as venerated Hallicrafters' S-38, and without their image problems.

One of the last tube-type kit regens was Heathkit's GR-81 "Economy SWL Receiver" of the mid-1960s. In implementation, it stood head and shoulders above its last-of-the-breed competitors such as Knight's long-lived and continually-evolving "Ocean Hopper." My GR-81 is still in regular service, primarily monitoring international single-sideband aviation channels.

As with Heathkits of that period, its chief detraction was its horrible color — a caterpillar-squish green panel and a beige cover. It was a bit pricey, too. For a only few bucks more, you could buy an already-built imported short wave superhet.

With its four-range, three-gang bandswitch and its tight audio wiring, the GR-81 was not a simple kit to build. In common with other Heathkits of the era, it was a physical overachiever. Its heavy-gauge steel chassis, front panel and cover, gave it a mechanical stability not seen in other kit regens. It weighed a substantial 9¾ lb. on the operating table!

Heathkit's assembly manual described the set's 140 kHz-to-18 MHz coverage:

"The Model GR-81 SWL (Short Wave Listener) has been designed to provide a large scope of listening excitement from stations of many parts of the world. The four bands of frequencies that are covered will allow reception of the 160, 80, 40, and 20 meter amateur bands, marine signals, aircraft signals, distress frequencies, standard broadcasts, government stations, etc. ..."

The long-wave band permitted reception of navigation beacons, as well as the "A & N beams" and the continuous aviation weather broadcasts of the era. If conditions were right, and you had a good antenna and a quiet location, you could even pick up European low-frequency broadcasters. One winter evening not too long ago, I caught France's Radio Allouis on 162 kHz. The set's broadcast coverage of 530 to 1750 kHz ranges from the low-power information stations to the new expansion outlets.

The Main Tuning capacitor's gear drive was spring loaded for minimum backlash. Frequency calibration, with the Fine Tuning control set to mid-scale, was quite good. This was probably due to using the accurately-specified lead lengths between the coils and the bandswitch.

Signal acquisition with any regen is a two-handed exercise that sometimes makes you wish you had three! The regeneration control must be kept near its critical point while tuning. Once a signal is within the range of the Fine Tuning control, it is optimized by slight manipulations of

that control together with the Regeneration and Volume controls. The procedure becomes simple with experience.

The GR-81's manual continues:

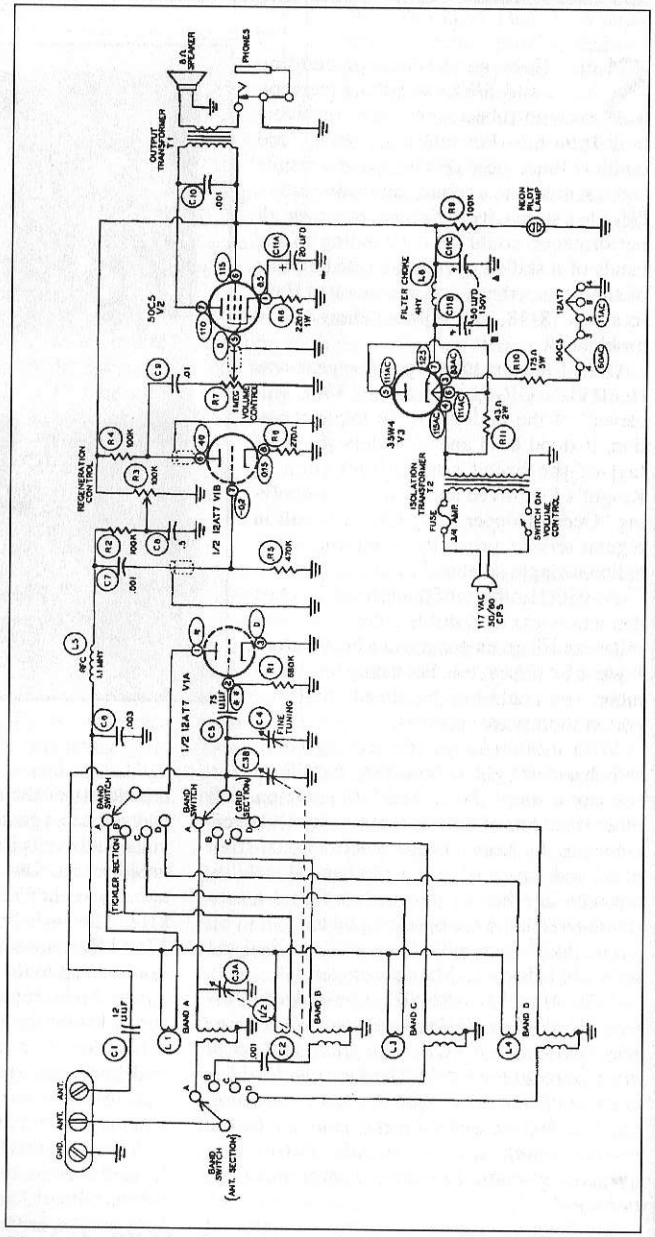
"... There are provisions for a short or a long antenna to cope with reception characteristics in various localities, depending on signal frequencies and strengths. The circuit of the Radio incorporates a filter choke in the power supply for a low hum level and a power isolation transformer to eliminate shock hazards normally common to series-string AC-DC circuits."

Unlike many regens, the set's coils had antenna windings. There was little frequency change with antennas of different lengths when using the long antenna connection. An 11 mmf capacitor allowed coupling to a short antenna, but a large dial calibration shift resulted when one was employed. Even with the choke-type power supply, an additional 100 mFd filter capacitance helped to further reduce residual hum, especially when using headphones.

Even with its power transformer, the GR-81 employed a 12AT7 detector/first audio, 50C5 second audio and 35W4 rectifier tube line-up. One wonders why Heath engineers chose this complement, when a 6.3 volt winding on the transformer would have allowed a far broader choice of tubes. Maybe they had a large inventory of transformers.

As with any kit, modifications were imperative. Kit builders, after all, knew more about designing radios than EEs! A Micalex socket replaced the Bakelite wafer socket for the 12AT7. Since the set's regeneration was controlled by varying the detector's plate voltage, a higher-wattage, lower-value (25k) pot was immediately called for. As with tube-type hi-fi

(continued on page 54)



Here's the GR-81 schematic, as it looked prior to author Strippel's mods.

THE VACUUM TUBE

EDITED BY

Bro. Patrick Dowd, F.S.C., W2GK

4415 Post Road, The Bronx, NY 10471-3499

Please include SASE for reply.

Project Tinkertoy

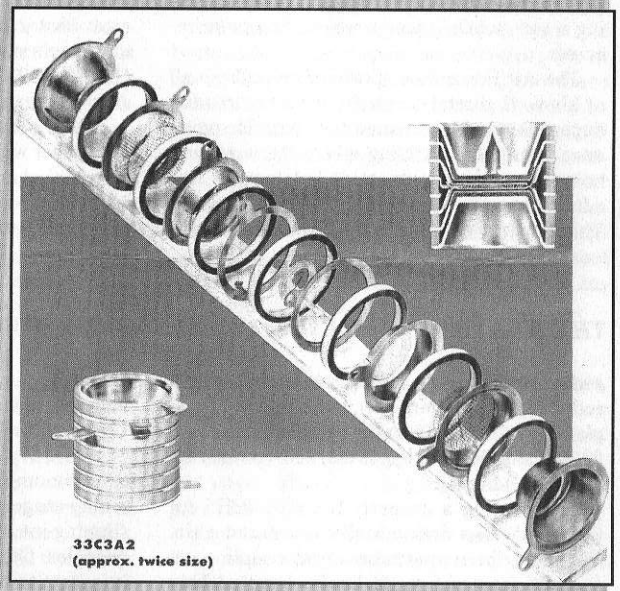
Some years ago, George Rose, former head of Advanced R&D at RCA, gave me several samples of Eimac receiving tubes and a copy of the flyer announcing their planned release. I recently came across the flyer in my files. In order to track down the history of these tubes, I contacted Bill Orr (W6SAI) and ultimately was put in contact with Hank Brown (W6HB), Don Preist (ex-G2ML), Paul Williams and George Badger (W6TC), all Eimac retirees. The following information is a composite of their recollections.

In the mid-fifties, Eimac was approached by a representative from Wright Air Force Base to develop a set of receiving tubes for military and computer use. The Air Force needed computers

Assembled, exploded and sectional views of Eimac's 33C3A2 ceramic receiving tube as they appeared in promotional brochure. The accompanying copy enthusiastically hyped the new line:

...Rugged..small, Eimac Stacked Ceramic Receiving Tubes are immune to damage by extreme physical shock and thermal conditions.

Their design eliminates internal insulators and spacers—electrode assemblies are entirely self-supporting. Thus, Eimac ceramic receiving tubes can withstand heavy accelerative forces from shock or vibration while suppressing noise output.



Their metal-ceramic construction inhibits deterioration of electrical characteristics even when operating continuously with envelope temperatures of more than 300 degrees centigrade.

Eimac is now starting production on four of these new tubes. they include the 33CA2, a twin-triode amplifier; the 5C2A, a sharp-cutoff pentode; and two developmental tubes: the CD-19, a medium-mu triode; and the CD-22, a beam-power amplifier.

Developed for the future—to meet the ever more-strenuous demands on electronic equipment, Eimac Stacked Ceramic Receiving Tubes promise to open broad new avenues in the field of electronics.

to store vast quantities of information. At the time, transistors were unreliable. This project was christened "Project Tinkertoy."

The tubes were to be shock-proof, able to withstand temperatures as high as 300°C, since possible use in space was considered, and easily and quickly manufactured. It was later realized that this temperature was unrealistic for space use, and I suspect that the temperature requirement was really inserted by the Air Force to make their computers more reliable. The thousands of vacuum tubes used in early computers created extreme temperatures which resulted in high tube failure rates.

Eimac took a novel approach in attempting to solve these problems. The tubes were of stacked planar construction, the metal elements being separated by ceramic wafers. They were small in size (⅝" diameter, length varying from ⅝" to ⅞"). Some had tubulation out one end, while others were evacuated in a vacuum chamber. George Badger recalls that he conducted a demo in which one of the tubes was dipped first into liquid nitrogen, then into boiling water, while it was working in a radio receiver.

The Air Force liaison officer carried out all of his work directly with the Eimac marketing department, which created the flyer. He never once visited the building where the work was being done. Apparently the whole project was administered in an exceedingly sloppy manner. This caused trouble with the Eimac accounting department. Neither group knew what the other was doing, which probably accounted for the careless record keeping on this project. There are no test data extant on these tubes. It would seem that Eimac had good reason to be less than enthusiastic about this contract.

A limited number of Eimac receiving tubes were manufactured. The project never got out of the developmental stage. About the time they were ready to go into production, in the late fifties, the transistor came into its own and the project was canceled. Eimac's first and last venture into the realm of receiving tubes had come to an end.

It is probable that other major tube manufacturing companies were also contacted about "Project Tinkertoy." At this time RCA was developing their Nuvistor tube family and G.E. their Mini-ceramic tube family. There is no information available to indicate that these were part of the Government project. It is interesting to note, however, that shortly afterward, G.E. came out with two groups of stacked tubes. One group (Z-2664, 7296 and 7588) was almost identical in size, shape and construction to Eimac's stacked tubes, while the other group (17462, 7625, 7720 and 8082) were mini-versions, about half the size.

Eimac's receiving tubes are rather rare since they never went into full production. However, there are some in circulation. The AWA Museum has a set and several tube collectors have samples.

THE HEATHKIT GR-81 "ECONOMY SWL RECEIVER", *continued from page 52*

audio amps, a one-watt detector plate resistor reduced noise. Increasing the audio amp's plate resistor to 270k and its cathode resistor to 6800 ohms (10 mFd bypassed) substantially increased audio gain.

Substituting a properly-biased 50EH5 for the 50C5 also dramatically increased gain. Changing the output tube's grid coupling capacitors from .01 to .001 mFd lowered hum and unnecessary low frequency audio response. Increasing the output transformer's shunt capacitor from .001 to .01 mFd lessened annoying high frequency whistles. Shunting the 35W4's plate to cathode with a silicon rectifier boosted B+ and gain. These changes resulted in a real radio.

Heath's engineers showed their skill when it came to the detector's grid leak resistor and capacitor combination. Conventional wisdom among regen fans called for a high value (1 megohm or higher) resistor and a capacitor of 100 mmF or more. The GR-81 used 680k and 75 mmF. Try others as I might, these proved to be optimum compromise values for the entire tuning range. One of the set's idiosyncrasies is slipping into super-regeneration on higher frequencies. Other values of grid leak and capacitor seem to worsen the tendency.

As I said before, my GR-81 is still in regular service. In addition to routine HF aviation weather broadcasts, I hear overseas commercial and military aircraft position reports. With the Micalex socket, the set's long-term frequency stability is excellent. Once warmed up and tuned, it just sits there, muttering atmospherics, until a signal comes in.

I've had my GR-81 for 30 years. I think I'll keep it a while longer.

REVIEWS: WHAT'S NEW IN PRINT

EDITED BY
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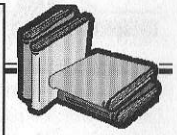
Please include SASE for reply.



The Science of Radio

By Paul J. Nahin, Professor of Electrical Engineering, University of New Hampshire. Published 1996 by American Institute of Physics. 329 pages. 6 by 9¼ inches. Softcover. $14.95. For ordering information, call 800-809-2247.

In this book's title, read "The Science Of" as "The Mathematical Underpinnings Of." The author refers to his book as an "advanced primer" on radio, aimed at the "beginning second year student in any major who has the appropriate math/physics background," meaning freshman calculus and physics. As this reviewer learned, that now includes familiarity with double integrals, differential equations, Fourier transforms and Hilbert transforms. Author Nahin is quite believable when he reveals that he loves "the intellectual excitement and beauty of the history and mathematical theory of radio."

All this led your reviewer to wonder where he himself had gone astray. In the period 1928-1936, in studies leading to his MSEE degree, he was exposed to courses in calculus, differential equations and physics, and to such then-respected texts as Morecroft's *Principles of Radio Communication* (1927), Terman's *Radio Engineering* (1932), Everitt's *Communication Engineering* (1932), Glasgow's *Principles of Radio Engineering* (1936). These authors largely found simple algebra adequate to cover the subject matter.

But Nahin is probably right. When this reviewer joined the Patent Department of the old Philco organization, he found that a number of the top (and younger) inventors did indeed "think with mathematics." As they discussed their work they filled page after page with differential equations and other expressions. At that time it became apparent that I had indeed missed something. Today one can only regret that a 1930's Paul Nahin had not filled the shoes of some of our engineering instructors.

In spite of the author's love of math, he candidly reports that Major Edwin Armstrong, at a meeting of the IRE in 1936, after listening to a theoretician's explanation of the theory of FM radio, stated that "You don't make inventions with fancy math, you make them by jackassing storage batteries around the laboratory." Nahin also quotes Terman as stating, in 1938, that "An understanding of the mechanism by which energy is radiated from a circuit, and the derivation of the equations for expressing this radiation quantitatively, involves conceptions that are unfamiliar to engineers." So there you have it - why some old timers are a bit uneasy in the presence of higher math.

However, if you have a real interest in radio fundamentals, do not let the math content in this book scare you away. The book is interestingly written and thoroughly enjoyable. Nine of the book's twenty two chapters are essentially free of math. Chapter 20, dealing with single sideband radio, should be of interest even to those of us with a limited math background, and Chapter 5 reminds us that even in a 100% amplitude-modulated signal, two-thirds of the transmitted power is in the carrier wave, which conveys no information, with one-sixth of the power going into each of the two sidebands. So AM is at best about 17% as efficient as SSB. Hams need to be reminded of that now and then!

♦ ♦ ♦ ♦

Crystal Radio – History, Fundamentals, And Design

By P.A. Kinzie. Published 1996 by The Crystal Set Society, P.O. Box 3026, St. Louis, MO 63130. 124 pages. 8¼ by 5¼ inches. Softcover. $10.95 plus $2.50 S&H.

This little book is aimed at individuals who have an interest in learning more about crystal sets, their history, circuitry, and design. The publisher is the source of that interesting periodical, The Xtal Set Society *Newsletter* (see *OTB* February 19, 1994).

Chapter 1, "The History Of The Crystal Set" (37 Pages) established Kinzie as an interesting writer, and it was clearly based on some fairly thorough research. The bibliography for this chapter alone lists 21 sources, including even a paper written by this reviewer on that early

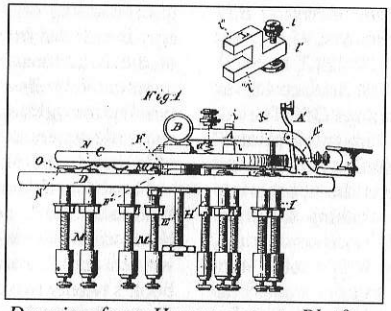
(continued on page 57)

KEY & TELEGRAPH

EDITED BY
Roger W. Reinke
5301 Neville Court, Alexandria, VA 22310-1113
Please include SASE for reply.

Compound Keys: Confusing Complexity

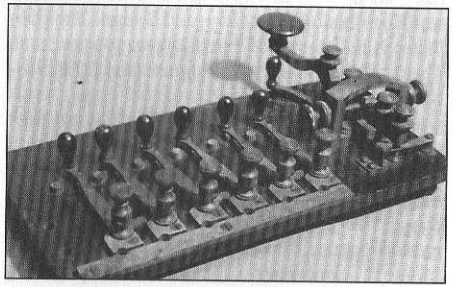
Some telegraph operating tables around 1875 must have been a jumble of keys, switches, sounders and relays — enough to inspire the concept of one key to serve many circuits. In a way, the goals of reducing instrument cost and certainly saving operating desk space were laudable, but apparently not sufficient to cause any major instrument maker to market a compound key. We've never come across one pictured in an operating setup, nor have we ever spotted one in various collections. The instrument photographed here was a lucky find, allegedly used in a railroad dispatcher's office.

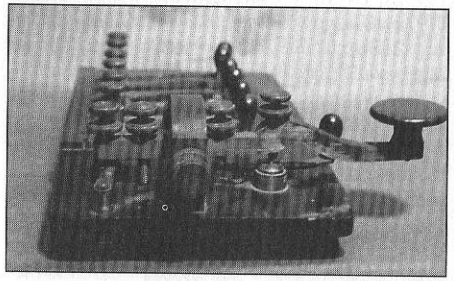


Drawing from Hussey patent. Platform "D" was attached to the top of the operating table.

It is likely that the compound key never achieved any significant success simply because a single, conventional key could be switched among various circuits through the use of a peg switchboard (the standard jack box and plug probably hadn't come into use at that point in time). But conventional practice didn't deter M.L.M. Hussey; he was granted Patent No. 166876 on August 17, 1875, for his "Compound Telegraph-Key." Hussey stated that his invention would " ... produce a simple device whereby the use of many keys and their adjuncts of sounders, switches, and the necessary complication of wires attached to the one or the other thereof, and several local batteries, is obviated..." Hussey's patent drawings, one of which is shown below, suggest that not very much complication was obviated.

The pictured key is a different configuration than Hussey's, of course, but it too is rather complicated by the need to preserve continuity in unused circuits while restricting operation to one selected circuit. No maker's name could be found on it. The camelback style strongly suggests Tillotson as the maker, but the knurling on the adjusting screws/jam nuts is very unlike





Left: This compound key was designed for operation on one of six circuits while maintaining continuity on the others. Above: The key's four screw adjustments from the knob end of the lever forward are (1) hammer/anvil gap; (2) spring tension; (3) lever resting position; (4) actuating arm for s.p.d.t. switch positioned under lever (the screw has an insulated tip).

Tillotson.

Hand-cut nuts underneath the platform tend to confirm an origin of pre-1875 or so, and suggest a custom-built rig. The key had not been restored when photographed. We would appreciate hearing from any reader who knows of other compound keys of this vintage.

The Lewis Key, continued...

It never fails — as soon as an assertion is made like "No known examples," examples become known (*OTB* for February, 1997). At least three, anyway, in the style of the Lewis '76 patent, distinguished by a straight, solid, thick lever with spring adjustment provided. Thanks to Dave Pennes and Neal McEwen for the detective work. If there are any Lewis keys around like the original 1875 Design Patent model, they remain unrevealed so far. Now there's a challenge.

REVIEWS/WHAT'S NEW IN PRINT, *continued from page 55*

developer of the crystal detector, Jagadis Chunder Bose, published in the *OTB* of February 1986!

Chapters 2 and 3 cover receiver fundamentals including such topics as antennas, tuning, wave traps, detectors, sensitivity vs selectivity, and single, double, and triple-tuned circuits. Chapter 4, "Crystals For Detectors," covers detector materials, contacting methods, and base connections. Here again, the bibliography is very comprehensive.

The book would have been even more useful to beginning builders if, in addition to the many excellent schematic diagrams, it had included one or two pictorial diagrams to give the reader some idea of what a completed set might look like.

♦ ♦ ♦ ♦

Heathkit—A Guide To The Amateur Radio Products

By Chuck Penson, WA7ZZE. Published 1995 by Electric Radio Press, Inc., Durango, CO. 248 pages. 8½ by 11 inches. 248 pages. Softcover. Available from A.R.C., P.O. Box 2, Carlisle, MA 01744 at $24.95 plus $3.00 S&H.

The Heath Company of Benton Harbor, Michigan, 1947-1991 (its "Kit" years) is no more. But for the many Heathkit enthusiasts who want more than old catalogs and assembled products to mark the Company's great influence on hams and short-wave radio fans, Chuck Penson offers this very readable and comprehensive Heath history and product guide.

As readers will learn from the 26-page "History of the Heath Company," it wasn't until 1947, twenty-six years after the death of founder Edward Heath, that the company produced its first kit product, a 5-inch oscilloscope. You'll learn that the company decided to produce kits of interest to hams when, in 1951, it hired Roger Mace, "an active ham with no formal degree in electronics." Under his leadership Heath developed the CW-only AT-1 transmitter, introduced in late 1951 and priced at $29.50. Its input power was about 20 watts from an internal power supply, with coverage from 80 through 10 meters. The AT-1 was offered for only four years, but it was a success and set the stage for the 200 amateur kits to follow.

Most interesting is the author's account of the effect on Heath personnel of the 1957 appearance of the Collins KWM-1 transceiver, then "the envy and desire of almost every ham." The Yaesu 101's influence on Heath "to deliver a clearly superior rig at a clearly competitive price" is also described.

Of course, the major section of the book, "A Guide To The Amateur Radio Products" (207 pages) is directed to those products that became of such great interest to amateurs. Each entry includes an excellent photograph of the product, along with its size, price, specifications, and some comments. Typically, each product rates a page, though some, like the 5-Band AM/CW transmitter (DX-60), received three photos and two pages.

Now that Heathkit is history, this book is a much-deserved epitaph.

♦ ♦ ♦ ♦

Vintage Radios By The Score

By Jerry Reedy. Article in the February 1997 Smithsonian (pages 108-113). Available in Public libraries; also from the publishers, Smithsonian Associates, 1-800-766-2149.

This article's lead-in tells us that "Tucked into an Elgin, Illinois, office building, Ralph Muchow's Historical Radio Museum houses the world's foremost antique collection". Subscribers to Smithsonian magazine already have it, but others will certainly want to see this interesting article. The illustrations (there are thirteen) are superb, and the accompanying text leaves one wishing that AWA member Ralph had been given 60 pages instead of just six.

Incidentally, when I first met him in 1970, Ralph told me that he would answer to most any pronunciation, but that as a practicing dentist he did NOT like "Much Ow!"

CLASSIFIED ADS

Old-time ads are free to members collecting and restoring equipment for personal use. Please observe the following: (1) one ad per issue per member; (2) include as SASE if acknowledgement is desired; (3) material must be more than 25 years old and related to electronic communications; (4) give your full name, address and zip code; (5) repeats require another notice (we are not organized to repeat automatically); (6) the AWA is not responsible for any transaction; (7) we retain the right to reduce an ad's size if over seven lines; (8) AWA does not accept commercial advertising in this column; and (9) the deadline for ads in the August issue is June 15, 1997. Ads received after that time will be held for the following issue. Mail all ads to:

Richard Ransley, P.O. Box 41, Sodus, NY 14551

SELL/TRADE — BC/SW TUBE RADIOS

Zenith H-500 Transoceanic, $100. Want Zenith 7G605 Clipper, SX-42 receiver, power supply (5 pin) for SW-5. Carter Elliott, 1460 Pinedale Rd., Charlottesville, VA 22901 (804) 979-7383

SELL/TRADE—COMMUNICATIONS GEAR

Hallicrafters SX101A with manual and speaker, $225; Hallicrafters SX62A with R48 speaker, $300. Both in excellent physical condition and working. UPS shipping extra. Phil Guigan, 106 Page Road, Litchfield, NH 03052 (603) 889-6213

Johnson Viking 500, $1,000, pickup only; Collins 212S1 audio console, $375, P/U only; Viking Valiant cabinet, $45; 3251 junker, $40; Addison Model 5 red Catalin, B.O. over $1,100; Heathkit PT-1 tuner, $135; Heathkit Vectorscope IO-101, $45; Heathkit Electronic Switch, $35. Michael Behar, WM1O, 17 Gerlach Place, Larchmont, NY 10538 (914) 834-7678

SELL/TRADE — GENERAL

RCA-Rider Channelyst, NRI Tester 1175-X, Millen R-9, Heath 1M-25 FET VOM, Monitoradio M-40 mobile 30-50 Mc. Converter. Walt Belsito, K1RTS, 149 Southmayd Road, Waterbury, CT 06705 (203) 756-6376

Philco Mystery tuner, very nice cabinet, complete, $75; Grundig Majestic table Model 85, AM/FM works well, $30; Marantz remote tuner, Model ST 100 with PM 100 amplifier, exc. but missing remote control, $50; Mivar Italian 5 band table Model 67, clean, $40; misc. WE tubes. Write or call for list. Crystal set and one, two and three tube construction plan from early '30s radio articles. All items plus UPS. SASE for replies. Ernie Nagy, P.O. Box 822, Elk Rapids, MI 39629-0822 (616) 264-9412

Thousands of radio/electronic/miscellaneous items from 70 years' collection of antiques, books, catalogs, flyers, brochures, manuals, magazines, radios, televisions, ham equipment/parts, radio/tube testers, scientific, photographic, military, automotive, recreational vehicle, HVAC, engineers drafting, artists, equipment and supplies. Send $2 for large 80 page list which will be sent immediately by first class mail. Francis Yonker, W2IBH, 1229 Inverary Place, State College, PA 16801 (814) 867-1400

Trade RCA Radiola Sr w/dud BBT WD11; Eimac 304 TL, 250 TH, transmitting tubes (in box); Eimac KY21A rectifier in box; Grimes 5B (mint) w/papers. Want Early xtal & regenerative sets, horns, parts, Grebe and Amrad sets. Sodion S-13 tube (need good fil.). J.C. Woychowski, 81 Penn. Ave., Niantic, CT 06357 (860) 739-6579, leave message

Edison C-2 Combination Radio-Phonograph. The last Edison diamond disc phonograph and the only one to play diamond discs electrically, in near mint condition, $3500; Dumont Royal Sovereign 30" television, electrically restored. Superb overall condition, $1500. Paul Baker, 4066 Loring Ave., Blasdell, NY 14219 (716) 826-2192

After 50 years of radio/tv/auto radio service and collecting, will be selling off all unwanted items. Will be tag and box lots sale. Cash and carry. Monday to Friday, first 2 weeks of May 1997. Frank Krantz, 100 Osage Ave., Somerdale, NJ 08083 (609) 783-0400

Museum quality Remler 8 tube kit superhet with tubes, $300, and qualitone Deluxe loop antenna with original box and advertising brochure, $150. You must pick up.Geo. Hausske, W9OLE, 1922 E. Indiana St., Wheaton, IL 60187 (630) 668-3845

Recordio 1C10, as found, clean, $50; Fisher MC4155 stereo rec. Cassette, $45; Fisher, 450 with remote cable, $35; Sony Reel to reel TC 352D, $75; RCA 911K needs pushbuttons recapped, no shipping, $150; RCA 29K refinished & recapped , no shipping, $195; Adm. Buckrogers dial recapped, no shipping, $395; RCA V219 cabinet only, no ship, $45;VM568 radio phono, as found, no ship, $75; Metz 404WF, $75,; Admiral 17" bakelite, no ship, $50; All sets work unless noted. Shipping extra. Robert Rossi, 10936 Melbourne St., Allen Park, MI 48101

Crystal sets, battery radios, Crosleys, Radiolas, cathderals, tombstones, Kadette Jr's, TV items, books, magazines, catalogues, tube manuals, Riders, old telegraph keys, earphones, radio games, old experimenters electric motors, electrostatic CRT's. Large list. SASE . Bill Rolf, 30131 Center Ridge, Westlake, OH 44145

Addison Model 5A; Atwater Kent Model 10B (mint); Marconi bust, lifesize made in UK circa 1933; Marconiphone A and Cosmos Revophone crystal sets; rainbow 01-A's; Airline 01-A (gold); transistors. Send $1. For list. A.R. Nolf, 539 Kastelic Place, Burlington, Ontario, Canada L7N 3S9 (905) 333-4557 e-mail ARN@globalerve.net

Federal 101 BC Band RCVR/FSM, w/manual; R-748/TRC47 VHF-AM XTAL controlled RCVR w/schematic; TA-264/PT field phone; TS-183V battery tester; TU-51 (BC 610 TU) C1306/GRA14 control box; I-130 VHF signal generator; TV-7 tube tester w/manuals; Leitch meter matic VTVM model 21-56; Jackson 643 VOM. Melvyn Stoller, K2AOQ, 100 Stockton Lane, Rochester, NY 14625

SELL/TRADE — KEYS AND TELEGRAPH

Small antique key collection of 8 rare types: British Double Current Key, French Oil Break Key, WWI Marconi Flameproof Spark Key, U.S. Mfg., Marconi Type 365 - London Mfg., British Post Office Key, Preece Plunger Key, J-7 Flameproof Key with blinker light, 3-J51 keys. Also Cooke and Wheatstone single needle telegraph and Foote Pierson & Co. Inc. Aero Morse Recorder used by Elmo Pickerell in first air to ground wireless tests by U. S. Air Force at the old Miniola Air Field in Long Island during WWI. Phil Weingarten, 67-61 Alderton St., Forest Hills, NY 11374-5231 (718) 896-3545

One each Model 32 and Model 33 Teleprinter, floor cabinet versions, very little use, $45/ea. Or $75/both. NOS TTL interface color monitors, open frame, var. CRT sizes, $5/ea. I need tension spring and "hot side" binding post assembly for W.U. #2A Legless Key mfg. By Menominee Electric. Dale Svetanoff, WA9ENA, P.O. Box 1317, Crystal Lake, IL 60039-1317

16+page illustrated list of my surplus telegraph collectables. $3. + 2 stamps ($5. Refund on purchase of $25.) Joe Jacobs, 5 Yorktown Place, Fort Salonga, NY 11768 (516) 261-1576 e-mail joekey@aol.com

Best offers on the following: omnigraphs, keys, sounders, practice sets, Pony relays, standard relays and other telegraph related items. LSASE for illustrated list. Herman Fothe, 5292 Tiffany Ann, West Palm Beach, FL 33417 (561) 688-2794

SELL/TRADE — LITERATURE

Now available: eight-page Supplement 2 to Tube Lore. Can be downloaded as an RTF file for local printing, from the NJARC home page, http://www.eht.com/oldradio, or send a 32 cent SASE to Tube Lore, 44A E. Main St., Flemington, NJ 08822

The "Locator"/ Available again in third edition. All 2- through 8-tube, AC and AC/DC radios in Rider's Volumes 1 through 23 indexed by tube complements, plus other helpful identifying information for each listing. 122 pages, plastic spiral bound. Only $14.95 ppd. In USA. Gerald Larson, 7841 W. Elmgrove Dr., Elmwood Park, IL 60707 (708) 452-7679

Catalogs, manuals, handbooks, magazines, books (Radiotron 3rd, 4th, etc.), Sams (TSM, CB, etc.) Wants Riders 22, 23; Radio News June 1945, Jan. 1944, Jan. & Sept. 1942; Radio-Craft 1943 June, July, Aug., Oct.; Catalogs Radio Shack 1954; B-A 1954, '55, '60 WRL 1952, '53, '54, '55, '56, '63. Alvin Bernard, P.O. Box 690098, Orlando, FL (407) 351-5536

1928-43 European radio schematics. More than 1300 pages and 1400 schematics (bound copies), $100. Argirios L. Adamidis, Kampouridi 19, Panorama, Thessaloniki, Greece 55236, (031) 342405

71 issues of AWA OTB: June 1978 thru Dec, 1996. Missing only 3 issues: Vol. 19, #4, Vol. 21, # 1, #3. $100. takes all. To be sold as a lot only. Foreign order must add for 15 lbs. shipping; Also 29 various issues of ARCI News, MAARC Broadcaster, The Reproducer, IHRS Bulletin, The Antique Radio Gazette, years: '79, '81, '82, '83, '84, '85, '90. $5. Takes all; add for 5 lbs. shipping. Jim Farago, 4017 42nd Ave., South Minneapolis, MN 55406-3528 (612) 722-0708

Guide For Antique Bulb Collecting. Softcover book by Eugene H. Brown. 1979 Centennial edition, 148 pages with one light bulb illustration, description and suggested price per page. One book

$12, three books, $30. Priority mail postpaid. Richard Bock, 1001 Meadow Lane, Fortuna, CA 95540

SELL/TRADE — MILITARY

RCA AR88 and CR88 WWII military receivers, $225. each plus shipping. Larry Asp, Box 509, Ayr, Ontario, Canada N0B 1E0 (519) 632-7921 evenings EDT

SELL/TRADE — PARTS

RCA Model 100-A speaker, bronze color, good condition with small wear spot on fabric on one side. B/O or trade for keys, bugs, sounder or Zenith Transoceanic. Bob Cutter, 701 19th St., Glenwood Springs, CO 81601 (970) 945-6653, e-mail bcutter@ teal.csn.net

Reproduction dial covers & clock lenses (Hammarlund, etc.) Sample or detailed drawing. $10. Postpaid. William Turner, WA0ADI, 1117 Pike St., Charles, MD 63301 (314) 925-1307

Over 200 early (1924-1947) embossed and lacquered, brass radio, tv and record player nameplates and labels, including brand names, model names and functional pieces, such as dials etc. Found stored in archives of original nameplate mfr. w/customer info. Names include Meck, Keentone, Kent, Arvin, Crosley. Also saved were approx. 50 hand engraved, 2 piece matched steel embossing dies capable of reproducing authentic radio and tv labels for restoration projects. The 200 labels sold as a lot. Dies can be bought individually. Write for further info. Tim Garwood, 2120 Settlers Trail, Vandilia, OH 45377

SELL/TRADE — TEST GEAR

Unbuilt Heathkit 5 inch 5 MHz, Model IOD-4540. Best offer. Send SASE for full info, or e-mail to: russell@sierra.net Ron Russell, 1927 Laxalt Way, Elko, NV 89801 (702) 738-7474

SELL/TRADE—TRANSISTOR/ CRYSTAL SETS

Older transistor radios, especially Japanese sets made by Crown, Capehart, Toshiba, Harpers and Zephyr. Parts radios, new in box radios, any size collection bought. Also have transistor radios and tube radios for sale/trade. Nice stuff gets nice stuff. Don Maurer, 29 South 4th St., Lebanon, PA 17042 (717) 272-2481 Dmradios@aol.com

SELL/TRADE — TUBES & TRANSISTORS

Misc. Tubes - WE, RCA, and EIMAC. Some BB/TT, and others including power. SASE for list. Jan Perkins, 524 Bonita Canyon Way, Brea, CA 92821

WANTED — BC/SW TUBE RADIOS

Emerson 520 Catalin any color or condition, also Fada portable P80. Louis Yadevia, 601 Church Lane, Upper Darby, PA 19082 (610) 622-2573

1945-1953 plywood radios from the following companies: Emerson Medel #503, #513, #535 or any with the perforated fronts; Tele-Tone #117, 117A with speaker holes; RCA Model #28T. State price based on condition. Also want Zenith "Radio-Nurse" brown plastic speakers. Steven Cabella, 500 Red Hill Ave., San Anselmo, CA 94960 (415) 461-6810

WANTED — COMMUNICATIONS GEAR

Harvey-Wells R9/R9A, T90, ASP90 PS, Ten-Tec Model 315, Mosley CM-1, RME 50/50A, RCA AR88D, McMurdo-Silver 801/801B w/coils. State price and condition. Herman Schnur, Route 3, Box 151, Greenville, NC 27858 (919) 752-2264

Hallicrafters SX-42, must be cosmetically in good to excellent condition, working or not. Also I need a set of coils for an SW-3. Buzz Stone, 204 Page Road, Nashville, TN 37205 (615) 297-7100

Want Gonset Model G-28, EICO 730 plate monitor manual for EICO 720 kit. Dan Kernan, K3XR, 218 Balthaser Rd., Sinking Spring, PA 19608 (610) 670 2980

Early Collins radio equipment, memorabilia, promotional items, Signal magazines; Vibroplex Zephyr or McElroy bug; National HRO-60. Brian Roberts, K9VKY, 130 Taara Dr., Fombell, PA 16123 (412) 758-2688

WANTED — GENERAL

Wire recorders, spools of recording wire. Please send make, model, condition, price. Also looking for full set of Radio Riders manuals. Tom Earnest, P.O. Box 62032, San Angelo, TX 76906-2032 (915) 651-9506 Fax -7080

Collectable Collins Radio items, accessories, sales literature and Signals magazines. National HRO-50, HRO-6, and your old bug you no longer use. Brian Roberts, K9VKY, 130 Tara Dr., Fombell, PA 16123 (412) 758-2688

Antique medical and scientific devices. Especially the very early, ornate, or unusual. Richard Cane, 1333 N.W. 127th Dr., Sunrise, FL 33323 (954) 846-7116

Small 1920s radios, especially Crosley 50, 51, 52, Radiola III, IIIA. Also small cathedrals and tombstones, horn and cone speakers. Restorable sets ok. Also need an MC 1466C chip (voltage stabilizer).

Argirios L. Adamidis, Kampouridi 19, Panorama, Thessaloniki, Greece 55236 (031) 342405

RCA radio or amplifier chassis for Victor Electrola's. Desperately need radio drawer for VE 9-54 and right hand horseshoe pick-up for Victor VE 10-69. Always interested in buying Victor Electrola's especially models: 9-25, 10-51, 10-70, 12-2 and 12-15. Jeff Lendaro, 1107 Logan St., Noblesville, IN 46060-2346 (317) 773-3969 e-mail lendaroj@ indy.tce.com

Jewell Meter, Pattern No. 54, 0-300 milliamps DC, 3" metallic silver dial. Bad meter movement OK if dial scale is in good condition. Don Chester, K4KYV, Old Dover Road, Woodlawn, TN 37191 (615) 647-2179

WANTED — INFORMATION

Need schematics for Willard "B" Eleminators. Listed in Rider's Vol II. Will pay your costs for copy. Bill Noro, 126 Evaline Street, Pittsburgh, PA 15235 (412) 371-2988

Schematic and/or service info with voltages for General Electric television Model 806. Richard Marlow, 4 Corbett Avle., St. Catharines, Ontario, Canada, L2N 5M4 (905) 934-9378 or (05) 566-9265

Any information on following items: RCA No. 150 test oscillator, EICO 460 oscilloscope, Clough Brengle OMA Wobbulator/Signal Generator, Jackson 640 test oscillator (Series 2A). Also Philco service bulletin 282, instruction form 39-5533, or any other info covering Cone-centic tuning mechanism, as used in Philco 38-7 radio. I have Philips Service Data from 1930s to 1960s, mostly Dutch & German plus British which can be photocopied. Also have Japanese transistor radio service data from 1960s and 1970s. Ross Paton, 56 Glengarry Road, Glen Eden, Auckland 1007, New Zealand, phone 064 9 818 8463

Info on Hammarlund coil sets, #SWK-4 and #SWK-6, coil form diameter, and for each coil, number of turns, coil-to-coil spacing, length, tap point. Frank Lotito, K3DZ, 1428 O'Block Road, Pittsburgh, PA 15239

Looking for info on the following companies and/or their radios: Buckwalter Radio Corp., A&M Radio Co., Madison Moore Radio Co., Gillett Marvel crystal radio, Pyle-Amplex radio, Nollenberger & Dorner Radio. All are companies who built radios in the 1920s. Will pay postage and any reproduction costs. Wayne Gilbert, 10751 Routt St., Broomfield, CO 80021 (303)465-0883 e-mail wagil@ aol.com

WANTED — KEYS AND TELEGRAPH

Private collector would like to add to my telegraph collection. Always looking for pre-1870 keys, sounders, registers and related; large spark era keys especially oil break; and unusual speed keys from obscure makers. Please help! Gil Schlehman, K9WDY, 335 Indianapolis Ave., Downers Grove, IL 60515, (630) 968-2320

Pre-1915 keys, sounders, relays and related items. Also spark keys and pre-1930 offbrand bugs. Many items for trade. SASE or e-mail (nmcewen@ metronet.com) for list. Neal McEwen, 612 Stillmeadow, Richardson, TX 75081 (972-234-1653

WANTED — LITERATURE

Manual for a tube tester, EMC Model 213. Thanks. R.A. Rawliuk, Box 317, Nenana, AK 99760

Want specific pre-1923 issues of QST magazine, for my personal collection. Eddy Swynar, VE3CUI, 3773 Concession Road 3, R.R. #8, Newcastle, Ontario L1B 1L9, Canada

Manual or copy of KW204, British transmitter. Will pay costs. Leonard Gardner, 458 Two Mile Creek Road, Tonawanda, NY 14150 (716) 873-0447

Calibration instructions/service data for Hickok 6000 tube tester; Radio Boys books. Steve Beale, 4694 Chickasaw Rd., Memphis, TN 38117 (901) 685-0209

Radio Boys Books, with dust jackets, by Chapman. I am especially looking for On Signal Island, Aiding the Snow Bound and To the Rescue. I have some extras to trade. Henry O'Meara, 42 Aqua Ra Drive, Jensen Beach, FL 34957 (561) 229-2307

Literature (manuals, books) on early microcomputers using 8008 CPU such as Radio Electronics, Mark 8, Scelbi. Also parts for same and 1702 EPROM programmer, Please send LSASE for list of radios, literature to sell/trade. David Dameron, 819 Boundary Pl., Manhattan Beach, CA 90266

Looking for back issues of The Old Timer's Bulletin from the very first one (Volume, Number 1) right through to the present. Also looking back issues of the AWA Review, Volumes #1 through 8. Thank you. Daniel Racovaz, 1237 Albion Rd., Rexdale, Ontario, Canada M9V 1A9 (416) 743-7052

Out of print books, War Secrets in the Ether, by Wilhelm F. Flicke and Contact at Sea by Dr. Peter B Schroeder. David Whiting, Box 2536, South Porcupine, Ontario, Canada P0N 1H0

WANTED — MILITARY

BC-222 or BC-322 also known as SCR-194 and SCR 195 and need antenna: AN-29 or AN-29B, AN-30 or AN-30B. Also need handset TS-11. John

Field, 2335 Benton St., Santa Clara, CA 95050-4432 (408) 246-1383 evenings

Looking for the following items to restore the WW2 SCR-299 Radio Truck: Table MC-269, Control Box BC-731, Junction Box JB49 and Antenna Tuner BC-729. Would also like to hear from people who have operated the SCR-299. Paul Thekan, 335 Rutherford Ave., Redwood City, CA 94061-3514 (415) 367-1499 e-mail Paul.Thekan@eimac.cpii.com

Military entertainment radios LRR-6 by Technical Radio Co., Industrial Tool/Die Model 6000-BAC, or any other including foreign. Also soliciting personal histories on their use in the military. Henry Engstrom, KD6KWH, P.O. Box 5846, Santa Rosa, CA 95402 (707) 544-5179

Radar H2S transmitter type TR31G1. Derk Rouwhorst, Postbus 24, 74G0AA Delden, Holland fax 01131 74 376 3132

SCR-584 antenna dish, APS-6 Airborne Radar, all or parts of, SCR-720 Airborne Radar - all or parts of. Bob Dwight, Historical Electronics Museum, P.O. Box 746, M.S. 4015, Baltimore, MD 21203 Ph. (410) 765-2345 fax (410) 765-0240 internet EchoSCR270@aol.com

WANTED — PARTS

Power for RCA TM-21 Color Monitor #213987 McIntosh MC-40 Output Transformer #M224. J. Ballard, 39 Boston St., Middleton, MA 01949 (508) 774-4041

Need coil sets for restored National HRO-5TA1. Have coil sets A thru E, are there any others? Also need Drake UV-3, Drake B-line accessories and a large rolling inductor for 811A linear. Who can tell me about a Western Electric 328A vacuum tube? Please state price & condition on National and Drake items. Your responses are appreciated. F. Fuhrer, KA2HLW, P.O. Box 3, Kent, AL 36045

Oscillator coil 262 kc IF or univerasl coil. Harry Taubin, 3097 Lakewood Dr., Harrisonburg, VA 22801

National SW 3 coils - 60-70 series; NDC-8, NDC-10 speakers; NFM 83-50 FM adapter for NC98; Doghouse 5886 AB & 5880 AB. I love National radios. Any info to help me learn about the restoration of these wonderful radios, identification of equipment, please sent it to me. I will reimburse you. This is for my personal enjoyment. Sylvia Thompson, N1WVJ, 33 Lawton Foster Rd., Hopkinton, RI 02833 (401) 377-4912

Front panels for Hammarlund HQ-170A and HQ-180A in very good to excellent condition. Mine were ruined. Will consider parts radios with good panels. Bruce MacLellan, 2116 Evergreen Circle, Ontario, NY 14519 (315) 524-0742 e-mail brumac@juno.com

Need a back and antenna for Stromberg Carlson 5 tube radio, Model 1400-H. Also looking for Aatwater Kent diagram for a Model 4270 battery receiver. James Maloney, 1703 Leno Rd., Macedon, NY 14502

Small (receiver) size 140mmfd variable capacitors. National-Hammarlund-Bud, etc. Need 4. Also Silver-Marshall SM220 audio transformer w/good windings. Ralph Michelson, KG8FA, 4538, Golfview Dr., Brighton, MI 48116 (810) 225-9825

Four prong radio plug-in coils. Give quantity, price, including UPS. Anton George, 7203-39th Avenue, Kenosha, WI 53142

"S" Meter for 1940s HRO (or cheap RX), black wrinkle table speaker for RAS or HRO , I.D. plates for entire 1944 National RAS receiver and accessories. Thanks. Greg Greenwood, P.O. Box 1325, Weaverville, CA 96093 VM message wk# (707) 523-9122

WANTED — TRANSISTOR/CRYSTAL SETS

Zenith Royal 500 Deluxe pocket transistor radio. Must be electrically and cosmetically in excellent to mint condition only. Gordon Hullin, K2ZBU, 3666 Cold Springs Rd., Baldwinsville, NY 13027 (315) 622-0141

Transistor radios, Japanese and USA made, especially smaller sets and new in box radios. Also Washington/Baltimore TeleGuide magazines. I have nice deco wood and bakelite radios and vintage TVs to trade or sell/buy outright. Donald Maurer, 29 South 4th St., Lebanon, PA 17042 (717) 272-2481 e-mail Dmradios@aol.com

WANTED — TUBES & TRANSISTORS

Western Electric tubes: spherical 101D/102D/104D, VT2, 205A/B/D/E, 216A, 252A, 262A/B, 271A, 274A/B, 275A, 300A/B, 310A/B, 348A/B, VT52, 284D, 211A/D/E, 212E. Globe shape tubes: 10, 45, 50, 585, 586, single-plated 2A3, 845. If you have any of these or other triodes, please write/call/fax. I appreciate your help. Ming Yang, 1995 University Ave., #119m Berkeley, CA 94704 (510) 376-4220 fax (510) 376-8861

WE215A Peanut Tubes working or duds OK. (Navy base - 4 flat contacts like panel light bulbs). Bruce Russell. Call collect at home (604) 299-1116 or work (604) 298-1038 or packet VE7HII @ VE7ROB Shipping address is Blaine, WA

Recent Radio, TV and Entertainer Obituaries

Compiled by Charles S. Griffen W1GYR
1225 New Britain Ave., West Hartford, CT 06110-2405

Note: When known, the date of death is indicated in parenthesis.

LEW AYRES, 88, (12-30-96) actor. He was the original Dr. Kildare and became identified with the MGM film series of the same name. In 1930 Ayres starred opposite Greta Garbo in *All Quiet on the Western Front*. Earlier he appeared with her in her last silent film, *The Kiss*. His film career spanned six decades.

LaVERN BAKER, 67, (3-10-97) rhythm and blues singer. Some of her hit recordings include *Tweedle-Dee, Jim Dandy, Play It Fair, I Cried a Tear*, etc. She was inducted into the Rock Hall of Fame in 1991. Baker appeared on Broadway in *Black and Blue* beginning in 1990.

ADRIANA CASELOTTI, 80, (1-19-97) was the voice of Snow White. Walt Disney hired her in 1934 to provide the voice for Snow White in *Snow White and the Seven Dwarfs*. The film was Disney's first feature-length cartoon.

KEN CORNELL, 79, W21MB, (1-?-97) low-frequency writer and experimenter. He authored *The Low and Medium Frequency Radio Scrap Book* series and many radio articles over the years. He was a frequent contributor to *Lowdown*, the newsletter of the Longwave Club of America.

DAVID DOYLE, 67, (2-27-97) character actor. He is probably best remembered for playing the role of John Bosley on TV's *Charlie's Angels*. Other TV credits include *Ghost Writer, The Invisible Woman, Murder She Wrote, Love Boat, Fantasy Island*, etc. Doyle appeared in such movies as *Capricorn One, Vigilante Force, Act One*, etc. He was the voice of Grandpa Pickles in the Nickelodeon cartoon series *Rugrats*.

LARRY GATES, 81, (12-12-96) film, theater and television actor. Gates is perhaps best remembered for his role as H.B. Lewis in the long-running soap opera *Guiding Light*, for which he won an Emmy. His film credits include *Cat on a Hot Tin Roof, Bell, Book and Candle, In the Heat of the Night, Teahouse of the August Moon*, etc.

BARRY S. GRAY, 80, (12-21-96) talk radio pioneer. He was heard on WMCA(AM) in New York City for 39 years and spent the last seven working for WOR(AM). He is credited with creating the talk show format for radio.

BURTON LANE, 84, (1-5-97) composer. He composed the music for *Finian's Rainbow, On a Clear Day You Can See Forever*, etc. Lane wrote the complete score for *Hold On To Your Hats* (1940) which starred Al Jolson in his last Broadway role. His first movie, *Dancing Lady* (1933) was the film debut of Fred Astaire and featured the song *Everything I Have is Yours*.

TERRY H. LEE, 75, (2-14-97) former Chairman and CEO of Storer Communications Inc. He joined Storer in 1958 as the GM of WVUE(TV) Philadelphia. From there he transferred to WITI(TV) Milwaukee and then to WAGA(TV) Atlanta. Later, he became VP, Television; Executive VP; President and finally Chairman and CEO. He retired from that position in 1987.

SHELDON LEONARD, 89, (1-10-97) actor, producer and director. He appeared in such films as *Guys and Dolls, Pocketful of Miracles, It's a Wonderful Life*, etc. Leonard's TV producing credits include *The Andy Griffith Show, I Spy, The Dick Van Dyke Show*, etc. In 1957, and again in 1961, he won Emmy Awards for directing *The Danny Thomas Show*.

GERALD MARKS, 96, (1-27-97) composer. In 1931 he and Seymour Simons wrote *All of Me*, which was recorded by Paul Whiteman, Louis Armstrong, Count Basie, Johnny Ray and Frank Sinatra. He contributed to the scores of four Broadway shows, including *Ziegfeld Follies*. He wrote *Is It True What They Say About Dixie?* with Irving Caesar and Sammy Lerner in 1936. Al Jolson and Rudy Vallee contributed to its popularity.

MARCELLO MASTROIANNI, 72, (12-19-96) actor. He appeared in 150 films, of which eleven co-starred Sophia Loren, during a 50-year career. Some of his more notable films included *Les Miserables* (1947), *Three Girls From Rome, La Dolce Vita* (1960), *The Pizza Triangle* (1970), *Dark Eyes* (1987), *Ready to Wear* (1994), etc. He won best-actor awards at Cannes for his 1970 role in *The Pizza Triangle* and in 1987 for his performance in a Soviet film, *Dark Eyes*.

WILLIAM N. PARKER, 89, TV broadcasting pioneer. As General Chief Broadcasting Engineer for Western television from 1928-1933, he built the first commercial system of TV broadcasting equipment and receiving sets (Chicago, 1930). During World War II, he was involved in a highly secret tube development project for the U.S. Army and Navy. After the war, as an RCA employee, he earned more than 20 patents for his work in circuitry and tubes.

MARJORIE REYNOLDS, 80, (2-1-97) actress. She appeared with Bing Crosby and Fred Astaire in *Holiday Inn* (1942). Other film credits include *Ministry of Fear*, with Ray Milland, *Up in Mabel's Room* opposite Dennis O'Keefe and *Bring On the Girls* with Eddie Bracken. From 1953 to 1958 she played the wife of Chester A. Riley (William Bendix) in the TV series *The Life of Riley*.

ROBERT RIDGELY, 65, (2-8-97) film and TV actor. In the 1960s he appeared in such TV series as *Sea Hunt, Get Smart, The Gallant Men*, etc. Film credits include *Melvin and Howard, Philadelphia, Blazing Saddles, Robin Hood: Men in Tights, Beverly Hills Cop II, The Ref*, etc. He also did voiceovers for radio and TV commercials and created the cartoon voice of Tarzan.

ROBERT F. SARNOFF, 78, (2-22-97) communications executive. He joined NBC in 1948 and later became its President (1956) and Chairman (1958). In 1965 Sarnoff became President of RCA, then NBC's parent. He assumed the Chairmanship from his ailing father, General David Sarnoff, in 1968 and remained in that position until he resigned in 1975. During his tenure at NBC he helped usher in the era of color television, aired the first televised presidential debates, launched the weekend news program Monitor, pioneered racially integrated TV, etc.

TINY TIM (real name Herbert Khaury), 64, (11-30-96) singer. The entertainer made his first national television appearance on Rowan and Martin's *Laugh-In* the 1960s. His falsetto and ukulele-plunking rendition of *Tiptoe Thru' the Tulips* in 1968 made him famous and became his trademark.

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Information for this column was obtained from *Broadcasting and Cable, The Hartford Courant, The New York Times, QST* and *Variety*. Thanks to Frank Krantz for additional source material.

Shaw Bases on British Tubes

Page 368 of Tyne's Saga of the Vacuum Tube shows a G.E.C.-Marconi Osram VT 25 telephone repeater tube with a Shaw base. A tube of this type in my collection has the name "Shaw Standard Base" stamped into the metal base shell. Later versions of the VT 25 had the same base—unbranded, but unmistakably Shaw. These later bases were plated with polished nickel.

I have an Osram R tube with this base, as well as an HL.8 tube. The base was also used on the Marconi Osram VT 37, VT 37B, VT 39 and VT 40, as well as some HL 2 tubes made about 1930/32. The VT tubes were all British Post Office Repeater types.

During a recent trip to Brisbane, I saw a Marconi Osram DE 5 tube with the same base. I also saw a DE 3 tube with the brown Bakelite Shaw UV199 size base. The smaller base on the DE 3 would indicate that this tube is equivalent to the RCA UV 199. Brown Bakelite Shaw bases were used on the DE 5 tubes as well, but in the bigger size.

G.E.C. would have imported these bases from The United States for use on tubes made for export. Black Bakelite UX and UY bases were later made by the G.E.C. tube works in the late twenties and early thirties, and these tubes were used in quite a few radios and other equipment in this period.

G.E.C. was not the only British company to use Shaw bases, however, as I also have a British Thomson-Houston LJ4 tube with the nickel plated base. This tube is a 201-A type and B. T-H was the British arm of the American General Electric Company until 1927. G.E. would no doubt have supplied these bases to B.T-H. The Australian company, Amalgamated Wireless Valve Co. also used the small bakelite Shaw base on their V199 tubes until they started making their own bases.

—Contributed by Fin Stewart (Australia)

CONVERTING A ZENITH 4V31 TO A.C. POWER, *continued from page 46*

squeal sometimes, due to the rather loose wiring design. This usually can be corrected by moving the wire connected to the tone control away from the chassis. Another possibility is the wires going to the outside terminals of the volume control. Moving these may help. If not, those wires may need to be replaced with a shielded type.

The type 15 tubes naturally work fine in this set, but one other change I've used to get away from those high priced tubes is to replace them with 36s. Since type 36 tubes use 6.3 V filaments instead of the 2 volts used in the type 15s, some wiring changes are needed. So connect the filaments of the type 15 tube sockets in parallel with the other 6.3 V tubes, and remove the 9.1 ohm (RI2) resistor wire between the 15 (i.f. amplifier stage) and 75 tube sockets. The type 36 tubes look identical to the type 15s, so outside appearance is unchanged.

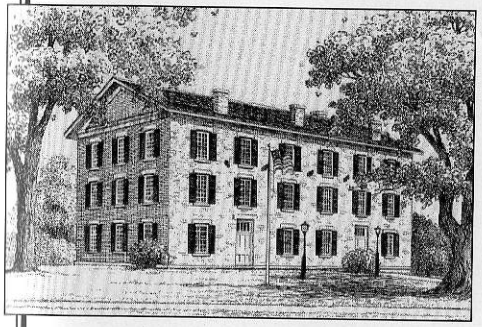
An alignment check is recommended after these tubes are installed. Also post a notice on the chassis, or in the cabinet, that type 36 tubes are now used instead of the original type 15s. We don't want someone burning up a good type 15 by mistake.

This set originally used a 6" magnetic speaker, which eliminated the need for an output transformer. By now the rubber mounting in the driver unit is probably hardened from age, so the sound is somewhat "tinny." If necessary that speaker can be replaced with a PM type and an appropriate output transformer. The transformer would need to match the 38 output tube, which has a load resistance of 13.5k ohms. Good luck.

THE MUSEUM

Visit our Internet web site: http://www.ggw.org/freenet/a/awa/

AWA Electronic Communication Museum



FREE ADMISSION

Location: Village Green, Rts. 5 & 20, Bloomfield, NY

Hours: May 1 through Oct. 31—Sunday 2-5 p.m.; June 1 through Aug. 31—Saturday 2-4 p.m.; July 1 through Aug. 31—Wednesday 7-9 p.m. (Closed holidays.)

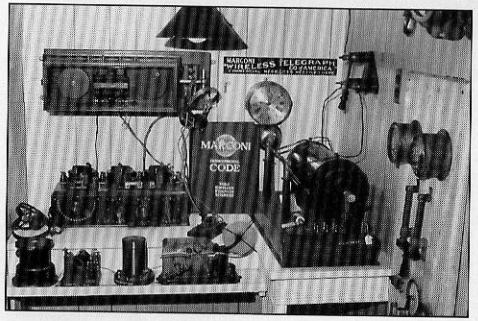
Group Tours: By appointment.

Museum Telephone: (716) 657-6260

Amateur Station: W2AN

Mailing Address: Bruce Kelley, Curator, 59 Main St., Bloomfield, NY 14469

The current interest in the 1912 Titanic disaster is attracting visitors to the Museum's Marconi ship station. The exhibit consists of a working 1907 Marconi multiple tuner and magnetic detector (mounted on wall) with the famous Marconi 10" spark coil transmitter at right. In the foreground is an original 1901 Marconi coherer and polar relay. Several of these rare pieces were given to the Museum by the British Marconi Co. of Chelmsford, England.(Photo by Bruce Kelley)



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MYSTERY PHOTO

Thanks to Bruce Kelley and the AWA museum for our May Mystery Photo! The people pictured are quite well-known to old-time hams and historically minded radio buffs alike. The occasion is a retirement party. We're looking forward to getting a lot of answers on this one!

The answer to the February Mystery Photo is on p. 5

Do you have an interesting and enigmatic photo from any period of radio history?

The* OTB *would like to consider it for publication on this page. Send your photo, along with the story behind it to Marc Ellis, Editor* OTB*, P.O. Box 1306, Evanston, IL, 60204-1306. All photos will be returned.