



OSCILLATOR

DELAWARE VALLEY HISTORIC RADIO CLUB

The Official Newsletter of the DVHRC

Vol. 4 No. 6, June 1996

JUNE MEETING

The June meeting will have two special features. The auction will be in two parts: an outdoors session in the parking lot at 7:00, with parts, consoles, chassis, *tchotchkes*, detritus, etc., to be followed by the regular indoors session at the end of the meeting. One of our members plans to offer literally a truckload of stuff, and everyone else is welcome to bring in material. Then Lewie Newhard will present a discussion on '20s TRF battery sets: how to identify them, how they work, how they differ from superhets, what's involved in getting them to play, etc. This meeting should be fun!

MAARC PUTS ON "RADIOACTIVITY 96"

It's time for RADIOACTIVITY. The Mid-Atlantic club is putting on its annual 2-½ day event at Timonium*, MD, on June 13-15. Specifically, the event will start at 6 PM on Thursday and run to 3 PM on Saturday. Events will include the flea market, four talks, an 11-category Old Equipment contest, videos on radio history and collecting, a banquet, and a good-sized auction. Site is the Holiday Inn Timonium Plaza, 2004 Greenspring Dr. - room reservations, (410) 252-7373. Registration fee is \$8; flea-market spaces are \$15 for the first, \$10 for additional; make checks payable to MAARC and send to Steve Snyderman, 4147 Lenox Dr., Fairfax, VA 22032.

** Timonium is a rare element, best known for RADIOACTIVITY. Located in the periodic chart between Neptunium and Unobtainium, it has a half-life of 5430 years and decays with a blue glow into Kryptonite. It forms a major ingredient in trinitrofolderol. Bring your Geiger counter.*

RADIORAMA '96

The Society for Preservation of Antique Radio Knowledge (SPARK) will produce its 1996 main event on Friday and Saturday, June 21-22. After a hospitality session on Thursday evening, the swapmeet will begin at dawn Friday. There will be an exhibition, "Fantastic Plastics" and a seminar on the same subject on Friday evening. The flea market resumes at sunup on Saturday. Site is the Signature Inn on Turfway Rd. in Florence, KY, (606) 371-0081, at Exit 182 of I-75 (second exit south of I-275), 10 min. south of Cincinnati. Room rate is \$49.95; general admission is \$5 per family; a vendor space is \$15 and includes two general admissions.

NEW TEXAS CLUB FORMED

When Joe Koester, a "founding father" and longtime president of MAARC, moved to San Antonio a couple of years ago, there was ample speculation as to how soon he'd be agitating for formation of a radio-collectors' club there. West Texas has always needed one: the Dallas and Houston groups have their territory well covered, but the Austin - San Antonio area was unserved as to local meetings. No longer: the Texas Antique Radio Club is now in operation to address the interests of "collectors, historians, and the curious." They expect to do the usual stuff - regular meetings, presentations, auctions, a grille-cloth and tube program, a newsletter, etc. Joe got elected president, and is the contact for member inquiries, etc: Joe Koester, 7111 Misty Brook, San Antonio, TX 78250-3498, (210) 522-1662.

ON THE HORIZON

- June 14-16** MAARC RADIOACTIVITY, Timonium, MD (see above).
- June 15** Raritan Valley (ex-W2QW) Hamfest, Columbia Park, Dunellen, NJ, off Washington Ave. (Rte. 529). Open to sellers 6 AM, buyers 8 AM.
- June 21-11** SPARK RadioRama '96, Cincinnati (see above).
- July 12-14** MARC EXTRAVAGANZA, Lansing, MI. Flea market, equipment contest, auction - the works. Details next month.
- July 20** Cherryville Hamfest, Warren Co. Fairgrounds, Warren Co., NJ.

THE OSCILLATOR

Newsletter of the Delaware Valley Historic Radio Club
Post Office Box 41031, Philadelphia, PA 19127

The *Oscillator* is published monthly by members of the non-profit DVHRC. Its purpose is to provide a forum to educate, inform, entertain, and communicate with collectors and preservers of vintage radio technology.

We welcome and solicit information relating to radio history or collecting. Submissions should be carefully researched, typed and accompanied with clear photographs or diagrams. Material on-disc (3-1/2" or 5-1/4" DOS) is particularly welcome.

Unless indicated otherwise, attributed reproduction for nonprofit purposes of any material in this publication is welcome. (Contact the editor to obtain copy on-disc.)

Personal views, opinions and technical advice offered in this newsletter do not necessarily reflect those of the members, officers or Board of Directors of the DVHRC, nor is the organization responsible for any buying or selling transaction incurred.

DVHRC BOARD OF DIRECTORS

Pete Grave Mike Koste Tony Molettiere
Bill Overbeck Ludwell Sibley

FOUNDING PRESIDENT

Jay Daveler

1996 DVHRC OFFICERS

President Bill Overbeck (610) 789-8199
Vice-President Tony Molettiere (215) 723-7459
Treasurer John Kern (215) 538-2128
Secretary Mike Koste (215) 646-6488

OSCILLATOR EDITOR

Ludwell ("Scoop") Sibley

OSCILLATOR CONTRIBUTORS

Alan Douglas

Alton DuBois, Jr. Mike Koste
Bob Thomas, W3QZO Ted Sowirka

DVHRC TECHNICAL COMMITTEE

Jim Amici Ned Borger
Lewis Newhard Ted Sowirka

FLEA MARKET & AUCTION COMMITTEE

Pete Grave Dave Abramson

LIBRARIAN & TUBE PROGRAM

Charlie Class

MEMBERSHIPS

Mike Koste

ARTICLES & MEMBER ADS

may be sent to the editor at 44 E. Main St, Flemington,
NJ 08822, (908) 782-4894.

COPY DEADLINE: The 20th of each month.

NEXT MEETINGS: June 11, AUG. 13

NJARC NOW ON-LINE

The New Jersey club now has its initial appearance on the World-Wide Web, via a home page devised by Internet enthusiast John Dilks, K2TQN. At the moment it's basic stuff: up comes the club logo in color, the information on when and where the club meets, how to get there, and space to run future event promos. The address is

http://ourworld.compuserve.com/homepages/Old_Radio/.

Dilks has gotten other visibility for antique radio lately. His display of early radios in the local library (March *Oscillator*) got written up in the Atlantic City newspaper. It ran a big photo of the display and devoted about 10 column-inches to the story. And, just as happened with comparable newspaper stories on DVHRCers Dave Abramson and Frank Hagenbuch, leads on radio goodies came in from the local community for a week afterward.

WANT ADS

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

FOR SALE: Howard W. Sams repair books: transistor (TSM), auto radio (AR), and hi-fi (MHF). Good supply. Lewie Newhard, (610) 262-3255 eves. (6-7/96)

WANTED: AC Dayton Model XL-60 chassis. Can be a junker but speaker and cabinet must be in better shape. A picture would be helpful. Stanley Thompson, 43 Cozy Corner, Avenel, NJ 07001-1122, (908) 636-3630. (5-6/96)

FOR SALE: Booklet of 64 pages describes Federal Tel. & Tel's radio operation from the beginning in 1921 to its demise in 1929. Over 60 illustrations, including pictures of early Federal RF and audio amps, all early radios, and many Federal parts. The article and NFWA presentation by Dick Schamberger, Federal expert, are included. All Federal models are listed with the year/month introduced, price new, and brief description. Buffalo's first broadcast station, Federal's WGR, is covered. There are two pages of references for more info. This is more about Federal than exists in any other spot! Good-quality printing. Send \$4.95 + 1.00 S & H to Larry Babcock, 8095 Centre Ln., East Amherst, NY 14051.

WANTED: Schematic for Stromberg-Carlson Model 60 DC farm set [not in *Rider's!*]; 10" speaker for Philco 38-7. Tony Flanagan, 92 Joysan Terrace, Freehold, NJ 07728, (908) 462-6638. (5-6/96)

FOR SALE: The DVHRC tube program offers clean, tested, boxed tubes at very reasonable prices with availability at any club meeting. Proceeds go to the club. About 300 types are currently in stock. Of course, donations of radio-type tubes in any condition are welcome. See Charlie Class at any monthly meeting to obtain or donate tubes.

QUASI-AD: DVHRC member Donald Ironside points out that, for phonograph-history enthusiasts, a copy of *From Tinfoil to Stereo*

is offered in a recent used-books catalog from Metacommet books, PO Box 2479, Providence, RI 02906, (401) 421-5750. This is the classic 1959 history by Oliver Read (then-editor of *Radio & Television News*) and Walter Welch. Those who have a copy will be impressed at the asking price (\$75); those who don't may want to take advantage of the opportunity.

BOOK REVIEW

RADIOS BY HALLICRAFTERS - WITH PRICE GUIDE

By Chuck Dachis, WD5EOG. 8-1/2" x 11" soft-cover format, 224 pp., 1996, Schiffer Publishing, Ltd., Atglen, PA 19310, ISBN 0-88740-929-6.

This is a rather decent collector's informant and price guide. It doesn't claim to be a definitive history of the company (*nobody's* done a serious history of Hallicrafters, to my knowledge), but the basics are there.

What's **good** about this book: Well, it depicts essentially the company's entire product line over a span of 40+ years, from the humble Sky Buddy to the hot-ziggety Dual Diversity. The examples pictured are assembled from the biggest and best known Hallicrafters collection in the galaxy, with generally good photos of radios in fine condition. A great deal of the photo work is in color. Echophone radios, from the company's '30s beginnings, and B & W TV sets of the '50s are included for completeness, via shots reprinted from catalogs and (unattributed) Sams Photofacts. Each set is described, along with its trade name, years of availability, and original price. Further pictorial work includes most of the company's plants as they appeared "then" and now, and clever coverage of Hallicrafters "go-withs": dealer signs, showroom banners, ad layouts, mikes, tubes, logos, employee jewelry, etc. There are chapters on restoration, the history of the entry-level Sky Buddy and S-38 series of receivers, etc. The equipment covered isn't just amateur-market gear: there are two-way, military, counterinsurgency, boat, CB, and home-entertainment sets, etc.; everything but Hallicrafters-built radar jammers like the AN/ALT-7.

What's **bad** about the book? Mostly details of composition. The lengthy descriptions of the sets are in full-caps, which makes them read annoyingly like **MESSAGE FROM COMSUBPAC**. There are spelling goofs galore, which is hard to understand in an era where all the compositor has to do is to hit the "spell check" key on the computer. The technical descriptions are good but could have used a read-over for small errors before going to press.

This looks like the new "standard reference" on this brand of radio. It'll definitely displace the ARCA-published Hallicrafters Story of 1991. The new Hallicrafters guide is available throughout the antique-radio "industry" at this point; the initial DVHRC stock sold out at the Downingtown meet, but there may be a reorder. - LAS

READERS' COMMENTS

I never worked in the local radio industry, but I was an electronics engineer in the local instrument industry since the tube days. So the recent article on the Shallcross resistors [Bob Thomas, W3QZO, "Shallcross Remembered," Nov.] rang the bell with me. Of course, the real high-volume resistors used in radios were the carbon or "comp" type, which evolved from a physical clunker to rather neat molded packages, made in billions. Twenty years or so ago there was a historical by (or about?) a Penn EE professor who claimed to have personally developed along about 1930. . . Of course, this work led to the growth of IRC [International Resistance Corp.], and other Pennsylvania makers, especially Stackpole and Speer of St. Marys, Elk County, and nearby towns. How Allen-Bradley got into the business, I never learned, although I have visited all four of these companies at least once. **Donald S. Ironside**

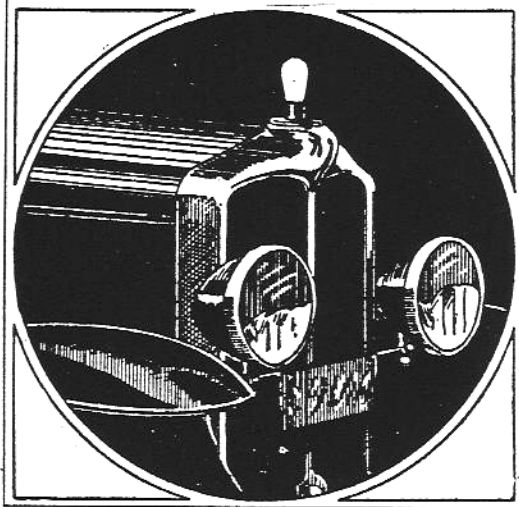
I recently read in *Science News* an interesting article, "Bite Size Vacuum Tubes." It described a revisit to the vacuum-tube area: using modern computer technology and new materials, they are re-inventing the vacuum tube in a new form. This advances very high frequencies for use in radar and cellular phones. Physicists Griff Bilbo and Christopher Hatfield at North Carolina State University have fashioned tiny vacuum tubes encased in diamonds! Tubes offer an advantage over semiconductors and computer chips, says Bilbo. They are more durable than semiconductors at high temperature, voltages, and radiation levels.

The researchers made arrays of vacuum tubes by encasing the electrodes in diamond and evacuating the air from the interior. These arrays look like rows of ridges and troughs. Each array looks like a glass bead the size of a match head.

The disadvantage of the old 1940s tubes is that they had to glow red-hot to emit electrons. The new tubes produce current at room temperatures. Ironical - the return of the prodigal! **Alton A. DuBois**

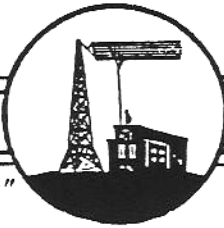
A RADIATOR ORNAMENT

Old-time idea from *Service* magazine: dress up your radio-service car by drilling holes in the radiator cap and inserting a silvered '01A.



AIRWAVES

"This Month in Radio History"



TIMELINE

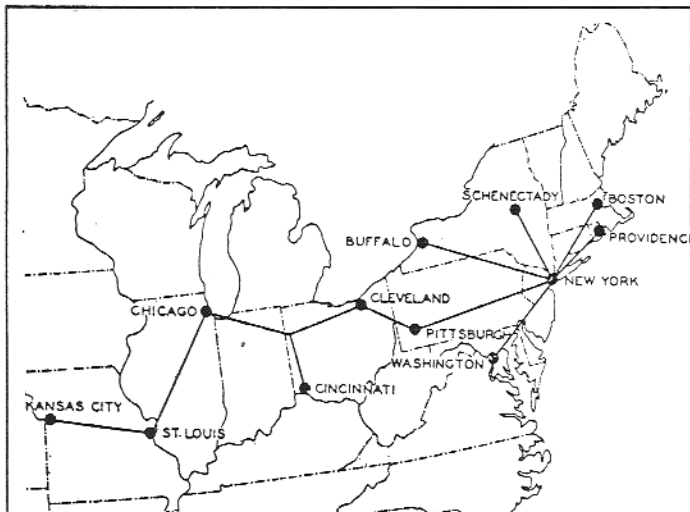
Compiled by Mike Koste

1901, June 10. The S. S. Slavonia was stranded off the Azores. The passengers and crew, numbering 410, were rescued from the wreck by vessels summoned by wireless.

1912, June 4. The International Radiotelegraphic Conference, opening in London, approved important regulations to security of practice in wireless telegraphic services. Its deliberations had been given significance by the Titanic disaster of April 15.

1923, June 21. First radio address by a U. S. President: Warren G. Harding speaks from St. Louis on "The World Court."

1924, June 10. America listens in to the first broadcast of a political convention as Cleveland hosts the GOP. The temporary network reaches stations in 12 cities; it was also used to cover the Democratic convention from June 24 to July 9.



"In 1924 it was considered a major accomplishment when Bell System wires connected radio stations in twelve cities for broadcasting the proceedings of the Republican national convention." - *Bell Telephone Quarterly*, April 1934.

1929, June 1. AT&T opens its new short-wave transmitting site at Lawrenceville, NJ for radiotelephone service to Europe and Argentina. Companion receiving site was Netcong, NJ.

1940, June 1. FCC authorizes commercial FM operation at 43-50 MHz.

1940, June 24. Telecast of Republican national convention is sent over coaxial cable from Philadelphia to

New York for air use.

1941, June 30. Bulova, Lever Brothers, Proctor & Gamble and the Sun Oil Company are the first sponsors of commercial telecasts on WNBC, New York.

1945, June 4. Radio's top client Proctor & Gamble spends \$11 million for air time annually.

1946, June 17. Southwestern Bell Tel. Co. opens mobile telephone service at St. Louis, using low-band VHF channels. Calls are placed through a special "mobile" operator.

1946, June 24. Skeptics are convinced that television is here to stay when Gillette's sponsorship of the Louis vs. Conn prizefight reaches 100,000 viewers on a four-city hookup.

1948, June 14. Vaudeville comes to television as The Texas Oil Company launches "Texaco Star Theatre" starring Milton Berle.

1948, June 30. Bell Labs stages first public demonstration of the newly invented point-contact transistor. Among other uses, an 11-transistor AC-powered superhet is shown.

1959, June 18. First transmission of movie film is tried over transatlantic cable, using a slow-scan technique. One minute of film, sent a frame at a time, shows London departure of Queen Elizabeth II for Canada. Sequence is aired over CBC and NBC TV networks.

1965, June 24. Early experimental version of PICTUREPHONE (R) service is tried out in New York, Chicago, and Washington: Lynda Byrd Johnson speaks to Dr. Elizabeth A. Wood of Bell Labs in New York. New York - Washington rate is \$16 for first three minutes; rate halved in 1965.

1965, June 21. The dean of radio news commentators, H. V. Kaltenborn, dies.

1967, June 30. Demo of cordless phones: Bell Labs shows off an "experimental lineless extension telephone, a battery-operated portable unit that performs the major functions of a regular telephone set." Cost of the experimental version was later reported by an old-timer to be about \$2000.

1969, June 2. NFL grants ABC-TV rights to Monday Night Football for a reported \$8 million per season.

1961, June 30. WXKW-FM, Allentown, signs on, now on 104.1 MHz with 50 kW @ 500'.

PENNSYLVANIA RADIO HISTORY

MORE ON JOHNSONBURG

In May of last year, your crusading *Oscillator* broke the forgotten story of the Johnsonburg Radio Corporation and its tubes. A main reason for the obscurity of this company is its lack of mention in radio publications of the time. The story thus relied heavily, and gratefully, on the crisp recollections of Arthur Baldwin, former chief engineer of the company. However, researcher Alan Douglas has now located a promotional piece on this company, printed in *Radio Retailer & Jobber* for June, 1930. Here's how the company was described at the time. (Don't let the flowery prose put you off . . .) - LAS

JRC Tube Venture Based on a Desire To Protect a Town

Tucked away near the very tops of the Alleghany [sic] mountains, in Pennsylvania, is the town of Johnsonburg, a busy and flourishing community, which has been known for many years as the "Paper City," because here are located the mills which furnish the paper for the *Saturday Evening Post*.

Now, because of production-shifts in those paper-mills, a new industry has been developed, in Johnsonburg, a local enterprise, founded by the same men who are behind The Castanea Paper Company, the producers of that paper, in quantities gigantic, with E. L. Myers acting as president of the corporation sponsoring the new venture.

The Johnsonburg Radio Corporation, for that is the name of the new concern, is unique in that it was incorporated not primarily to make money but to forestall a serious economic and social problem, which arose when a change in the type of manufacture of the Castanea Paper Company threw out of employment hundreds of girls, who were daughters of the older employees of that paper-producing concern.

Committee Approves Tube Venture

Because of such industrial crisis, a committee was appointed, to select and launch a manufacturing enterprise, which would aid these girls by giving them employment, and which would be a credit to the town of Johnsonburg. Finally, a radio-tube-factory was decided upon, as the one desirable undertaking, because the organizers believed there was a distinct need for a quality-radio-tube, in this busy world of to-day, which depends so much on broadcasting over the air for entertainment and education.

Thus, the origins of the Johnsonburg Radio Corporation are firmly implanted in sincerity of purpose and in a vision of the need of tomorrow. But, before the realization of such high ideals, hard work had to be done, with many struggles involved, ere triumph was assured.

An Engineering Personnel of Mark

First off, the Johnsonburg Radio Corporation gathered together a group of some of the best-known Radio engineers and physicists of the day. The Engineering Staff, of that new concern, was headed by A. V. Baldwin, formerly connected with the Canadian-Westinghouse Company.

To a research staff, headed by Dr. Williamson of Carnegie Technical Institute, who was aided by Dr. Hamm of Penn State, was given the task of delving into the ways and means of producing a better Radio tube. To forestall any lack of efficient tube-engineers, a Radio Fellowship was established at Penn State College, which is now held by H. L. Van Velzer, who will eventually join the present Engineering Staff of the Johnsonburg tube-manufacturing concern.

These men set to work to evolve a better Radio tube than any then on the market. After making many mistakes and suffering bitter misfortunes, it is said that they were actually able to offer, to the organizers of the new enterprise, a Radio tube which equalled in performance and was superior in construction to the tube of any other audion-manufacturer. Then the wheels of the new valve-producing industry were made to turn; then the new factory, with its modern bulb-making-machinery, began to produce the JRC Tube, the leading factory-brand of the Johnsonburg concern, now being offered to the public.

The Reasons for the Rise

Not without cause and justification is the JRC Tube rapidly ascending to its proper place of superiority in the Radio world. First comes the design of the tube, itself, with its completely-insulated-filament, which prevents any possible chance of internal "shorts," from filament to cathode, and which eliminates noise.

The especially-sturdy construction, with double-supports for grid, plate and mica-discs, at top and bottom, gives extremely long-life and durability to the tube. So firmly are the tube-elements held in place that it is almost impossible to change the spaces between them. A demonstration was staged, a short time ago, in which three JRC Tubes were dropped, at a height of eight-hundred-feet, from an aeroplane and, after the terrific concussion, all worked perfectly, when placed in a Radio-set. These two features, long life and prevention of "shorts," will do much to eliminate the "bugbear" of dealers - the replacing of faulty tubes.

Second Reason, Greater Care

The second cause, for the superiority of the JRC tubes, is the meticulous care used in their production. The delicacy of the operations, in making a bulb, require experienced labor and constant inspections. From the very beginning, of the preparations of the sub-assemblies of glass and flaring, through the blending of the physical elements, to the final operations of exhausting, bombarding, and sealing, the JRC tubes pass through the hands of numerous inspectors, who reject all but the best of the product in the various stages of development, and production.

Final tests are made of each tube, as it comes off the production-line, and even then rejections are made of those which do not fall within the narrow limits of extreme efficiency, as set by JRC engineers. In consequence, the Johnsonburg Radio Corporation offers to the public a Radio tube which possesses uniformity, durability, and which assures quiet and flawless operation.

WHEN TRANSISTORS CAME TO RCA BROADCAST EQUIPMENT

Bob Thomas, W3QZO

Advances in technology ordinarily proceed in a gradual, rather orderly manner, as in the growth of radio during the '30s. Occasionally, though, several related developments combine to cause a major advancement, such as displacement of spark and arc transmission by tube-generated CW, which occurred as a result of improvements in vacuum-tube design and manufacture. It is exceptional, however, when a new development is so radical, and so pervasive, that it not only causes a major discontinuity in the direction of entire industries, but profoundly alters the very fabric of society itself. Yet that is exactly what was wrought fifty years ago by the invention of the transistor.

Initial reaction to the announcement by Bell Labs in 1947 that they had invented the transistor varied widely. Some observers thought transistors would be consigned only to benign applications where power consumption was a critical issue. After all, they were fragile and unreliable, exhibited poor high-frequency performance, and had limited power-handling capability. Many of those limitations could be traced to the type of construction employed in what were known as point-contact transistors. These consisted of a tiny pellet of germanium and two thin wire "catwhiskers" (emitter and collector), spaced only 0.002" apart, where they pressed on the germanium "base." Manufacture of emitter and collector junctions was imprecise, resulting in widely varying electrical characteristics. Contaminants introduced further performance variations or complete failure of transistor action. Tiny emitter and collector junctions could not support high-power operation. Finally, fundamental constraints in the theoretical physics of this type of construction limited operation to low frequencies. Despite their numerous limitations, point-contact transistors flourished among electronic hobbyists and even found limited acceptance in low-end consumer products. However, they were unacceptable for industrial and military apparatus, where vagaries in performance and reliability are intolerable. So, recognizing the promise of transistors despite first-generation deficiencies, business leaders, scientists, and engineers embarked on ambitious programs of investment and innovation that would soon revolutionize the electronics industry - the semiconductor industry was born!

Within a few years, point contacts were supplanted by alloy junctions. This new technique enabled design of transistors with specific performance characteristics and facilitated volume production of a highly uniform product. It also made it feasible to manufacture PNP and NPN transistors with similar, though complementary, charac-

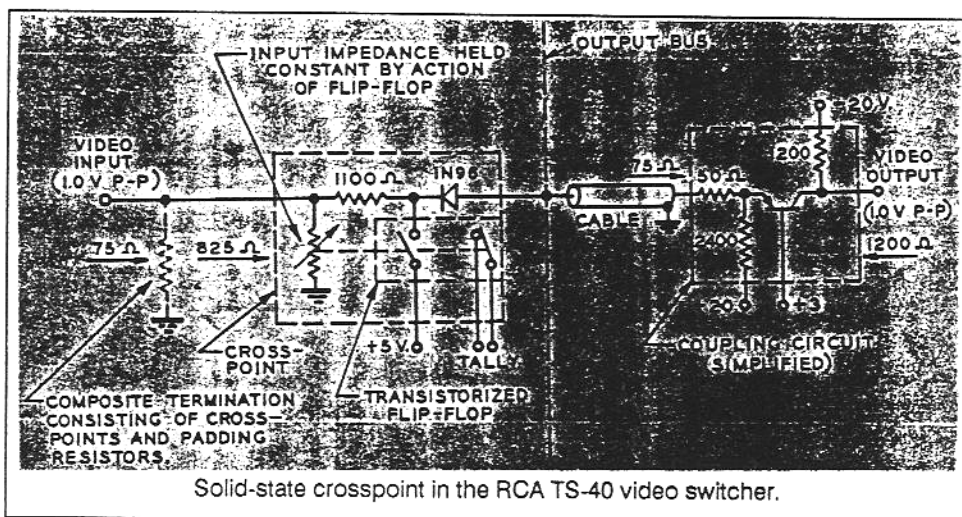
teristics (polarity-wise). This is the basis for the versatile "single-ended push-pull" circuit configuration known as *complementary symmetry*. Innovative techniques were developed to extend transistor frequency-cutoff to hundreds of megahertz and to power levels of over fifty watts. Problems caused by contamination were eliminated by replacing epoxy encapsulation with hermetically sealed packages and installing "clean room" production areas. Taken together, by 1956 these efforts had elevated the transistor from an experimenter's curiosity to a viable contender for virtually any application in commercial electronics.

Many of the innovations described above were pioneered at RCA's then-new semiconductor research and production facility in Somerville, New Jersey. Because of its major role in the burgeoning field of semiconductors, the Corporation had a compelling interest in rapid deployment of its latest devices in RCA products. The Broadcast Systems Division in Camden, as a leading supplier of broadcast equipment, was immediately targeted for implementation of the new technology. In preparation for the task ahead, Bell Labs was contracted to supply a crash course in solid-state technology for the division's design engineers. Classes were held at night, and consisted primarily of lectures concentrating on theoretical solid-state physics. Each class was supplemented by voluminous notes on related topics, which required diligent study between classes if one expected to understand subsequent material and avoid falling hopelessly behind. The rigorous learning process was quite demanding, coming as it did at the end of the day and in addition to normal work and personal responsibilities. Furthermore, although useful as a foundation for understanding solid-state technology, the course hardly equipped us to design practical transistor circuits, select appropriate devices, debug prototypes and then cure the myriad problems that are inevitably encountered in production and initial field operation. To supplement the Bell Labs training in transistor theory, a few talented broadcast engineers embarked on preparation of an in-house training seminar that emphasized the real-life aspects of solid-state circuit design. Again, company-sponsored after-hours classes were held, this time two nights a week for several months, until a high degree of confidence pervaded the entire engineering department. It was now 1957, and we were ready for Prime Time.

This would be no gradual, evolutionary change - it was a wrenching, permanent, and instantaneous departure from our association with vacuum-tube circuit design. Literally overnight, the comfortable language of tubes

was discarded for the transistor terminology only recently encountered in our formal classes and self-study. Terms like *amplification factor*, *plate resistance* and *secondary emission* vanished from our lexicon, their places being usurped by *h-parameters*, *minority carriers*, and *thermal resistance*. Additionally, an entirely new philosophy became necessary in order to break away from dependence on published characteristic curves which, although essential in many tube circuit designs, were misleading in the design of transistor circuits. On the bright side, at least we would be working with low voltages - no more shocks from those diabolical 280-volt, half-ampere regulated power supplies!

Selection of the first broadcast product for "transistorization" was easy. The then-current model of audio-video production switcher was a 1940s design using relays for selecting camera video and other program signal sources. It was hopelessly outdated and represented fertile ground for total redesign in the solid-state idiom. To minimize risk in applying transistors to a product for the first time, a circuit configuration was devised in which the actual video switching function was accomplished with diodes which were simply turned ON or OFF by d-c control transistors. Thus, in this early stage of conversion to transistors, there was a conservative degree of isolation between critical video signals and transistor performance. Transistors were also used throughout the digital control-logic circuits to achieve new flexibility in custom system configuration. Production of the TS-40 Video Switcher began in 1958, and while there were teething problems, they were solved in short order. The new switcher went on to enthusiastic customer acceptance, setting the stage for a new, daring project in solid-state product development.



Solid-state crosspoint in the RCA TS-40 video switcher.

At the beginning of 1960, practical television recording was not even four years old, so it's not surprising that the VTRs of the day still were based entirely upon vacuum tubes. VTRs were complex, bulky machines: the RCA TRT-1 occupied four seven-foot equipment racks. Having enjoyed success with the TS-40, attention now turned to transistorizing the huge video tape recorder. Fortunately, a VTR lends itself to division into several subsystems, each of which became the responsibility of one or two engineers, permitting the design to proceed in several areas at once. The new machine, designated the TR-22, was designed and in production in about 18 months. Our innovative piano-sized solid-state VTR thrust RCA into the lead in the television recording field less than four years after the decision had been made to exploit the new technology. As new developments became available, they were routinely incorporated in current projects. Germanium transistors were eventually superseded by silicon devices and integrated circuits. But those later-day developments were merely relapses to the evolutionary processes of earlier times, and which continue even today. The *revolution*, the cataclysmic event that launched our solid-state odyssey, had already taken place. We never looked back - tubes were forgotten forever (almost).

FOR THE RECORD

The April *Oscillator* included a listing of radio museums within range (more or less) of DVHRC country. Not included was the "National Broadcasters' Hall of Fame" museum in Freehold, NJ - because it flourished and vanished some years ago, for reasons that have never been clear. *Finis*.

A MEDITATION ON TUBE SUBSTITUTIONS

A couple of years back one of my NJ brethren needed a 7S7 tube to fix an RME communication receiver. No luck: neither the DVHRC tube program nor the NJARC supply had one, and I didn't myself. The 7S7 is a rare triode-hep-tode, like a loktal version of the 6K8; it's similar to the 7J7 but that's scarce too. Sure, one could hack up the receiver and change to a 6K8, but that's not exactly "restoration."

It occurs that the 12-volt version of the 7S7, the 14S7, is a lot easier to find. How to get 12 volts in a 6-volt receiver?

Well, one way would be to build into the radio a voltage-doubler rectifier that would turn six volts AC into 12 volts DC, more or less. Unfortunately, the two filter capacitors required are a bit bulky to fit under the chassis of a lot of receivers.

There should be a better way. We've all been throwing out those "picture-tube rejuvenators" from the '50s: the funny stubby cylinders that plug onto the back of a CRT and extend its useful life. These came in two styles. The plain *booster* type was an autotransformer that pushed the heater voltage up to nine volts or so, and squeezed a few hundred more hours of use out of a tube with weak emission. The *isolation* type was simply a 6-volt-to-6-volt isolation transformer, used to save pix tubes that had heater-to-cathode leakage. That's the type that we want. It was good for 600 mA of current, which is plenty.

The transformer inside is tiny: about 3/4 inch on a side. Wired as an 1:2 autotransformer, it's just what's needed to turn 6 volts into 12 volts to light that 14S7. What if the transformer is not the isolation kind? Well, one could easily rewind it: put on, say, 70 turns of #24 wire, center-tapped, and there's the desired autotransformer.

This idea isn't specific to 7S7s, of course: it applies in many cases where a potential substitute tube has the wrong heater voltage. If one were trying to fix, say, a Zenith postwar AM-FM set using the now-scarce 19T8, it wouldn't be too hard to rewind a CRT booster into a 3:1 autotransformer and use a common 6T8. - LAS

In the February Oscillator, we saw the long-delayed review by Alan Douglas of the "history" chapter of the book The Zenith Trans-Oceanic - the Royalty of Radios by John H. Bryant and Harold N. Cones. Last month's issue carried the authors' rebuttal, also long delayed, to Mr. Douglas' remarks. Douglas has provided some "reply comments," presented herewith.

THE GREEKS HAD A WORD FOR IT: HAGIOGRAPHY*

Alan Douglas

A few additional facts, and some of my opinions, may be of interest. First, it's worth mentioning that I am presently supplying copies of my correspondence with [Zenith pioneer] R. H. G. Mathews and Fred Cassens, and other source material, to Harold Cones, with the goal of making the next Zenith book the best possible.

I wrote my review originally to suit the readership of the *Old Timer's Bulletin*, and sent a copy to Mr. Bryant as a courtesy. The (former) OTB publisher kept it for several months before deciding (without notifying me) that it didn't fit in with his see-no-evil, hear-no-evil, speak-no-evil philosophy. I subsequently offered it to A. R. C., knowing that it was not really suitable for that publication (as well as being too long), but shifted it when *Radio Age* agreed to print it, contingent on receiving a rebuttal to have been printed simultaneously. The first draft of this rebuttal was withdrawn but the long-promised sequel never materialized [until publication in the *Oscillator*]. It has now been more than a year since the Trans-Oceanic book appeared, and not only have there been no efforts by its authors to correct the historical errors, but additional papers amplifying the same material have been read before two additional groups, and printed by one of them, the Third International Symposium on Telecommunications history in June 1995. Hence the deservedly harsh tone of my commentary.

It doesn't embarrass me to find new information that contradicts what I previously believed, but thus far, Mr. Bryant's "discussion" is long on invective but woefully short - devoid - of verifiable facts. 154 file drawers have

yielded not a single contemporary reference to support their view of 1920s history. Not a yellowed clipping, not a dated memo, not a letter. Nothing, in fact, earlier than 1938, and even that was a *Popular Science* story based on company-supplied data. Frankly, 154 boxcars of McDonald's recollections aren't worth (in John Nance Garner's exact words) a pitcher of warm piss. In the Symposium paper, we read in three different footnoted sources that he couldn't even decide on his father's occupation: insurance salesman, storekeeper, railroad worker; take your pick.

McDonald's personal papers are not in any sense the Zenith corporate archives. I defy anyone to find the names Pletcher or QRS in the official 1955 Zenith history, or in the two Bryant and Cones publications. I will say **absolutely** that Zenith would not have succeeded without Pletcher and QRS. Zenith in 1921 had essentially no factory, no personnel, no product, and - most importantly - no dealer organization. It is not accidental that the successful radio makers did have such networks in place, even before getting into radio manufacture: Atwater Kent, Majestic, Philco, RCA (by virtue of GE owning or controlling the major electrical distributors in every city). QRS provided the all-important ties to the best music dealers across the country, before they signed up with anyone else; without QRS, Zenith was dead in the water.

There is nothing in my books of Pletcher and McDonald falling out. In corresponding with Pletcher's grandson 15 years ago, he told me his mother recalled attending a 1930s party on the Mizpah, and thought that

* *Hagiography: The history of the sacred writings of or sacred persons; a narrative of the lives of the saints . . . (Webster)*

the two had remained friends. Tom Pletcher was a genuinely nice person, universally admired by his contemporaries.

Schnell's logs are hardly incomplete; printed right in the pages of *QST* are every last radio station heard or contacted. And in a seven-page article that reads like a diary of his voyage, the fact that this Earth-shaking transmission isn't even mentioned, means that either it was less important than a paragraph on being seasick, or more likely never happened at all. The "professors" have still not produced a shred of contemporary evidence for their claim.

If the Zenith firsts were "highly debatable," why are they all repeated uncritically in two subsequent "scholarly" papers? And here's the canard again about McDonald giving away shortwave radios to the Greenlanders in 1925. Which model? What would they have heard? I suppose he shipped the batteries out by UPS Second-Day Air?

Mr. Bryant is a bit late in trying to elevate Richard Evelyn Byrd to the Pantheon of military heroes; Byrd himself made unprecedented efforts to crash the gates. Read *Oceans, Poles, and Airmen* by Richard Montague (Random House, 1971) for an alternative account of his fraudulent exploits.

My idea of "supreme hubris" is being faced with two very different versions of the same events, but under pressure of a publisher's deadline, without attempting to verify any facts, plunging ahead anyway. Act in haste, repent at leisure.

Let me quote from my own foreword (p. iv) [to *Radio Manufacturers of the 1920s*] about my sources: "I have tried to avoid footnotes, not because the facts have no source, but because the sources are so scattered that footnotes would occupy more space than the text . . . Company history comes largely from *contemporary trade publications* (my emphasis). . . Some comes from radio magazines in general; some from later historical accounts by the men or companies involved." *In that order.*

On Academic Publishing and Controversy

There seems to be a view among some collectors - a DVHRC member I talked with [recently, for one] - that there is something wrong with controversy. Since this is only a hobby, we should all just "get along."

Well, as far as I'm concerned, we are. This is the normal give-and-take of academic publishing: you lay your cards on the table, and if someone trumps you, you lose. I published my facts, the "professors" have published theirs, and when the smoke clears, we will all have a more accurate Zenith history to work with. I expect I may change my views of some subjects, when and if I see contemporary evidence rather than anecdotal claims of its existence, and conversely I expect the "professors" to have their evidence in hand before publishing their version of history, next time around. Deadlines or no.

If "history is a lie agreed upon," then agreement cannot

be reached without controversy. Read the scholarly review of Tom Lewis' book *Empire of the Air* in *Technology and Culture* (Society for the History of Technology) if you want to see how academic criticism works; the reviewer did not like the book at all. Did you ever see a bad review of that one in the hobby press?

There are a few more points I would like to clarify, and the best way is to print part of a letter I wrote to John Bryant in May of last year, to which he makes some reference. One point remains: *Radio Digest* was a weekly magazine published in Chicago, not to be confused with *Reader's Digest*. Oh - and "minutiae" in corporate archives? Don't I wish. Most companies, of course, throw this junk out; not one radio company I researched had an accessible archive. I have worked for the same manufacturing company for 30 years, nearly its entire life span, and there is no "archive." Old records, even engineering files, get tossed out within a few years. And, yes, I have never visited Zenith, but (Prof.) Michael Schiffer spent a week there, and Dale Goodwin made many visits long before that (the Wincharger illustration came from me, via Dale). The problem with visiting a company yourself is that you must adopt the proper reverential attitude before they will take the time to dig out material for you. Writing an arms'-length account under these circumstances is nearly impossible.

May 23, 1995

Dear John,

I am rapidly losing patience with this byzantine plot, which puts words in my mouth that I never said or implied, and requires bowing low to Glenview five times a day. I propose that we get back to basics.

1. By styling yourselves as the "Radio Professors" and advertising your academic credentials, you are presumed to value historical accuracy. It is therefore not "unfair" to review your book on that basis.

2. You have invited critical review by stating flatly in your advertising "This book also contains much new information on the early history of Zenith radio."

3. I have addressed a number of specific points in your text where the historical facts at my disposal contradict your story. (These include all your source material too, since you have avowedly cited everything you used, in your end notes.) You have thus far offered no verifiable evidence that my facts are wrong. The obvious conclusion is that *the historical portion* of your book is seriously defective, and readers deserve to know this. Anything less would be dishonest, on your part or mine.

That's it in a nutshell, but let me amplify some points.

You claim to have discovered new people and new material, and are upset that I won't acknowledge this. (A) I have never denied it, but (B) it is irrelevant! My commentary applies to your book as published, not to future intentions or to newly discovered material not cited in your end notes.

You threaten (I take it) to defend your work "in public." You have already made that decision with the publication of your book. If you didn't check your facts beforehand, or chose to ignore contradictory information, the blame is squarely with you.

You can hardly label my commentary as "unfair" when it is based on terms that you yourselves have proposed. To quote

from your Foreword, "we want readers to be able to determine the exact source of our information, so they may judge for themselves the validity of our conclusions." Well? . . .

Indeed the tone of my commentary was harsh, and I think deservedly so. Shouldn't we expect high standards of historical accuracy from the "Radio Professors"? You had no compunction about using the same tone on Mike Schiffer in correcting his date error (he admitted he didn't know exactly!) while you are repeating stories that never even happened. And what are we to make of your Foreword, where you chide other authors (me?)

for not citing sources? You have not used a *single contemporary source* before 1938. For my part, I explained in my book why I did not use footnotes: at the rate of one note for every one or two sentences, they would soon occupy more space than the text, a financial impossibility. I at least noted sources and dates for every advertisement I used - did you? . . .

Regardless of what appears in print, you have my standing offer to review any of your material or text, or to provide copies of anything I used in writing my books.

Checking the Jan. 1926 issue of QST, the Navy's South Seas radio researcher Fred Schnell gives seven pages of elaborate details on his cruise. There's nary a word on reception of Commander McDonald and his singing Eskimos.

At this point, Bryant and Cones have been in print twice with their view of Zenith history, via the book and the Oscillator, and Douglas has also appeared twice. This should put matters to rest; it is hoped that the Oscillator page space devoted to this matter will result in a better Bryant-Cones book next year. - Ed.

FIRST CLASS MAIL

DVHRC
Box 41031
Philadelphia, PA 19127-0031

SPECIAL AUCTION THIS MONTH!!! SEE INSIDE.

