

All the Electrons that are fit to flow.



OSCILLATOR

The Official Newsletter of the DVHRC

Vol. 12, No. 10, Nov., 2004

Campaign 2004 at The DVHRC...Time to Nominate

Meeting Notes and Minutes – October 2004

Dave Snellman, Secretary, reporting

The October meeting of the DVHRC was called to order by our president, Mike Koste. We had a few visitors joining us for the first time at the meeting. Mike announced some upcoming events. RF Hill Hamfest, October 17th (already past,) NJARC Swapmet at Hazlet, November 7th, and our annual holiday party on December 14th at our regular meeting time.

We had some discussion about the Kutztown meet. Most people managed to “dry out” by now. The club did manage to clear around \$600 after all expenses were paid, so in spite of the weather the club did OK.

Speaking of Kutztown, DVHRC will be an official sponsor of the Spring meet to held May 13 and 14 at Renningers!

We had some “show and tell” items that night. The first was an interesting tube – a 4-prong tube with the number C401 printed on it. Also, a Spartan model 110AC, that’s the model number – not the line voltage. An early ‘60’s transistor wristwatch radio rounded out the show and tell. 110AC, that’s the model number – not the line voltage. An early ‘60’s transistor wristwatch radio rounded out the show and tell.

Stan Saeger made an announcement about an opportunity for promoting the club. Stan is organizing a radio display to be set up at the Southern Lehigh Library. The display is scheduled for a March 2005 opening. Anyone interested in placing a radio on display should contact Stan at an upcoming meeting, or

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NEXT MEETING TUESDAY NOV. 9TH, TELFORD

Next Meeting Program

Lou Poli presents his Navy
SP-600-JX (Sept 1951)

Covering the extended
range of 540.0 - 54.0 MHz

*Newsletter of the
Delaware Valley Historic Radio Club
P.O. Box 5053
New Britain, PA 18901
www.dvhrc.org*

Meeting Notes continued from Page 1

for a March 2005 opening. Anyone interested in placing a radio on display should contact Stan at an upcoming meeting, or you can email him at saegers@ptd.net

A few reminders: 1. Be sure to check out the DVHRC website located at www.dvhrc.org. 2. If you haven't joined our email reflector, please take a few minutes and do so. There is a link to the reflector on the website. It includes all you need to subscribe. 3. It's not too early to think about paying your 2005 club dues. All memberships come due in January of every year. We do not "pro-rate" memberships. If you see "2004" on your Oscillator's mailing label, it means you are paid for 2004 and your 2005 dues are due! Club dues are \$20.00 per year. You can pay at any meeting or you can mail your membership (checks only) to DVHRC, Box 5053, New Britain, PA 18901.

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The next meeting will be November 8, 2004 at the Telford Community Center, starting time is 7:30 PM.

NOMINATION NOTICE

The club secretary places this notice in the Oscillator for the general membership. At the November meeting, to be held on Tuesday, November 9, 2004 at the Telford Community Center, nominations will be held for officers and directors of the Delaware Valley Historic Radio Club.

ELECTION NOTICE

The club secretary places this notice in the Oscillator for the general membership. At the December meeting of the Delaware Valley Historic Radio Club elections will be held for the officers and board members who will serve for 2005. Ballots will be distributed to all members in good standing. All those in good standing will eligible to vote in the election.

David Snellman
Secretary/Treasurer

The Bruneval Raid ... and the rest of the story

by Bob Thomas, W3NE

Reginald V. Jones was a brilliant British scientist and wartime strategist, whose insightful analyses and clever application of information from decoded German Enigma messages utterly neutralized the Luftwaffe's elaborate system of radio beams that had guided Nazi bombers with deadly accuracy in early years of WW-II. Following that success, Jones turned his attention to dramatic advancements in German radar. French and Belgian Resistance operatives had reported construction of large rotatable parabolic reflectors and, at great risk, provided British intelligence with sketches and even photographs of the installations. This evidence contradicted a naive RAF



supposition that those structures were gigantic search lights. In fact, they were steerable UHF antennas, subsequently identified as such in aerial photographs taken in RAF reconnaissance flights by skilled Spitfire pilots diving at 300 mph through intense low level antiaircraft fire to an altitude of only fifty feet for oblique photography.

Recognizing that the antennas were frequently located in pairs near German airfields, Jones correctly deduced that they worked together in a radar system, one precisely locating the position of incoming British bombers, the other tracking Luftwaffe interceptors who were guided to the engage bombers by ground-based operators using voice transmission. That degree of accuracy demanded superb aiming precision, as even minute errors of azimuth or elevation in either half of the system would result in misdirection of the interceptor. The German code name for the system was *Wurzburg*. Monitoring stations in England determined the wavelength of transmissions to be 55 cm (imagine stable 545 MHz transmitters and receivers in 1941!). In contrast, the RAF used a single transmitter and receiver in a PPM (Pulse Position Modulation) system which displayed the target and interceptor as pips on a circular CRT display. Thus, instabilities and orientation errors affected both targets equally, and "all" that was necessary was for the pilot of the interceptor to close the gap between the pip representing his position with that of the bomber. KISS was alive and well sixty years ago!

A Wurzburg installation of particular interest was identified in one an aerial photos at the top a 100-foot chalk cliff in southern France, near the village of Bruneval. High Command planned a daring raid on the Bruneval installation to seize the radar system and deliver it to England for analysis. An attack force of 120 was assembled, consisting of the King's Own Scottish Borderers and the Black Watch – both highly disciplined, rugged Scotts paratroopers; a Navy security officer; and Flight Sergeant C.W.H. Cox, an RAF radar specialist who volunteered for the mission. To minimize risk of "forceful interrogation" should any of them be captured and identified as a specialist with knowledge of strategic information, all personnel were given temporary false Army serial numbers and Army uniforms. All, that is, except Sgt. Cox whose intractable RAF brass would not permit him to wear a non-RAF uniform despite possible tragic consequences from being singled out as a unique expert. No amount of

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In the afternoon of February 27, 1942, Navy evacuation ships embarked for the French coast near Bruneval. Later, on a frosty moonlit night early the next morning, ten airplanes carried the paratroopers and Cox to their drop into enemy territory. They immediately divided into three groups: one attacked the German garrison stationed nearby for defense of the Wurzburg installation; another engaged a small contingent at the radar site while Cox dismantled the equipment; and the third began a sweep to clear the beach where rescue ships, then waiting offshore, would land. With bullets whizzing around them, Cox and the naval officer horribly disconnected cables from the radar equipment mounted directly on the back of the parabola, unbolted critical equipment boxes from the antenna, then trundled their prizes down a steep slope through a foot of snow to the beach, which now had been secured by the third arm of the force. At the last minute, Commandos who had been engaging the main German garrison in a vicious battle, initiated “a tactical advance toward the rear,” joining the others in the boats, just landed at the beach, for return to England, reluctantly leaving behind two men killed and six missing.

Although it had been planned to study the equipment in the presence of a radar operator captured and brought back from Bruneval, it was soon learned he was a former jail bird who had been conscripted into the German army and had little knowledge of the equipment itself. Interestingly in that regard, when the top Nazi technical officer was debriefed by Jones after the war, he opined that German equipment *had* to minimize reliance on operator skill because Hitler’s ban on amateur radio in years prior to the war had so withered the reservoir of technically-inclined young men, that equipment had to be “fool proof”. In any case, examination of the captured radar yielded a mine of crucial information for countermeasures and, quite likely, some “reverse engineering” that benefited British radar. An additional benefit was that it gave Jones the stature among the RAF establishment to insist on using *window* (*chaff*, in U.S. terminology). By either term, the principle was to drop millions of fine aluminum threads, each a half-wavelength long, from an airplane to create a decoy that appeared on radar as an armada of bombers, causing a diversion of fighter planes from real bombing missions.

The survivors of the Bruneval raid got together for a reunion in 1947 to celebrate the twenty-fifth anniversary of their heroic operation. During the reception, Sgt. Cox chatted with one of the Scottish paratroopers. He mentioned how apprehensive he had been because of his vulnerability for being singled-out if captured in his RAF uniform while everyone else in was in Army dress. The ruddy Scott replied coldly, “That needn’t have troubled ye Laddie. If it appeared ye were about to be captured, we all had orders to shoot you!” And *that* is the rest of the story! [Summarized from Jones’ account in his book, *Most Secret War*.]

The Radio Collector's Library by Dave Snellman

Last time we looked at "Books for Beginners."

This outing, we'll begin to look at tube manuals. The inspiration for this installment of the Radio Collector's Library was an article I ran across in *Vacuum Tube Valley*, Issue 4, Volume 1. This issue is dated Spring/Summer 1996. It was called "Review of Tube Manuals." Though "VTV" is a periodical mainly for the vintage tube audio, vintage guitar amp and high-end audio crowds, it does present information useful to anyone interested in vintage electronics as well as the current state of vacuum tube electronics.

Tube manuals were published by manufacturers of vacuum tubes for use by engineers designing gear that employed their products. They also gained popularity with technicians and radio repairmen over the years. I have also observed that these manuals have become popular collectors items in the antique radio fraternity. Anytime one of these manuals pops up in an auction, it usually sells (assuming it meets the minimum bid.)

In almost any tube manual, regardless of the manufacturer, you find some basic information about the tube. Probably of most interest to someone repairing a set is the pin-out of the tube. Knowing the pin-out allows troubleshooters to measure voltages on the various elements of the tube. Other information in the manuals include the dimensions of the tube itself, as well as operating characteristics such as plate voltage, plate current, transconductance, and the μ , or amplification factor. Much of the information about the tube is there for the design engineers, but some of it is very useful to troubleshooters, especially if you don't have the schematic of the set you are working on. The typical operating environment of a tube will give you an idea of the voltage you might find on the plate or grid of the tube, for example.

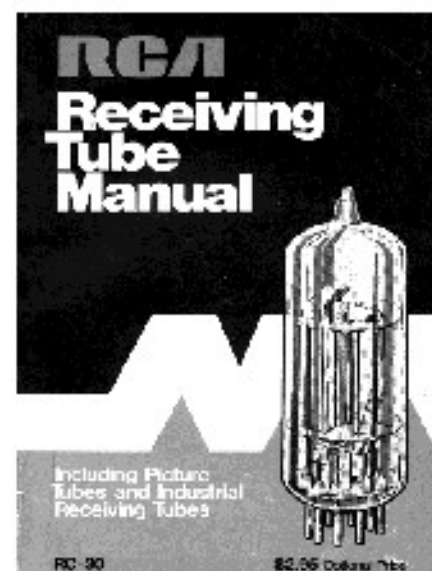
RCA Tube Manuals and other tube related publications

There are so many books, pamphlets, and handbooks that were published by RCA that I thought I'd devote this entire installment to some of the examples of what they had to offer. By far the most common and most popular tube manuals were produced by RCA.

RCA tube receiving tube manuals are identified by the designation "RC" followed by a number. The earliest manuals were based on information on "RCA Radiotrons" and "Cunningham Radio Tubes." This led to the designation of "RC" for all subsequent manuals. The "RC-10," dated 1932 included information on the manufacturing of tubes, characteristics of tubes, their applications and installation, socket connections, and their characteristics. Later manuals included examples of circuits using RCA tubes. The accuracy of some of these circuits was questionable, but they were included in all manuals up to "RC30." "RC-30" was the designation for the last receiving tube manual RCA produced. Table 1 outlines the various RCA Receiving Tube Manuals and their publication dates. The older manuals cover information on older tubes. 2A3's, 01A's, 26's and 27's will be well covered in RC-12, but they won't be found in RC-29. Manuals from the 1940's and early 1950's will cover

Receiving Tube Manuals and their publication dates. The older manuals cover information on older tubes. 2A3's, 01A's, 26's and 27's will be well covered in RC-12, but they won't be found in RC-29. Manuals from the 1940's and early 1950's will cover localities, but not the 5881's. Depending on your collecting interests, you might need one of more tubes manuals on your bookshelf.

Tube Manual	Publication date	Tube Manual	Publication date
RC-10	1932	RC-20	1960
RC-11	?	RC-21	1961
RC-12	1934	RC-22	1963
RC-13	?	RC-23	1964
RC-14	1940	RC-24	1965
RC-15	1947	RC-25	1965
RC-16	1950	RC-26	1968
RC-17	1954	RC-27	1970
RC-18	1956	RC-28	1971
RC-19	1959	RC-29	1973
		RC-30	1975



RCA also produced a series of manuals that provided information on their transmitting tubes. The "TT" series is the designation for the transmitter series. You'll find at least three transmitting tube manuals. "TT3" was published in 1938, followed in 1956 by "TT4." The last one was "TT5," published in 1962. Transmitting tube manuals included all the information you would find in an "RC" manual – they were just geared toward the tubes designated as transmitting tubes. Circuit examples were also part of these manuals. The manual describes the circuits as being "included in the Manual primarily to illustrate the use of generic tube types in diversified transmitting and industrial applications."

RCA also produced a series of tube manuals that were available via subscription. Referred to as the "HB" series, it consisted of a several loose-leaf binders (of non-standard size) that could be updated as new material became available. Publication dates for the information in this engineering series was from the 1930's to the 1960's. These were probably the most comprehensive sources of tube information available at the time. Be careful when looking for this series of manuals. Many times collectors will strip these manuals of the popular audio tube information and the buyer will find themselves left with a lot of TV tube info and not much else. Tube collectors will appreciate the less common volumes of this series, as they will provide information on CRT's, Thyratrons, industrial tubes, and other less common tube types.

Another publication that RCA produced was called the "RCA Resource Book." This was a pocket-sized manual that included basic information on various RCA products, including their tube line up. While functioning as a "date book", these small manuals included information on the RCA product line up for that particular year. I've seen examples of these books as early as 1938. The later ones run into the 1970's. Though the information in

functioning as a “date book”, these small manuals included information on the RCA product line up for that particular year. I’ve seen examples of these books as early as 1938. The later ones run into the 1970’s. Though the information in these books is not as comprehensive as an “RC,” “TT,” or “HB” manual, their “pocket” size makes them ideal to carry along for use as a reference at swap meets or meetings. The information was not limited to tube information. RCA offered various product lines and these books usually included the latest for that particular year.

Many other tube related publications were offered by RCA. “RCA High Fidelity Amplifier Circuits,” published in 1959, a 28-page flyer outlines tubes used in “Hi-Fi” circuitry. Tubes like the 7025, 7027A, and 7199 are included in this publication. A 1972 publication, “RCA Direct Replacement Guide,” listed RCA replacements for receiving tubes and TV picture tubes. There are too many other “specialty” publications to mention.

RCA also published some engineering texts. These were the Radiotron Designers Handbook’s. The third edition of this manual, edited by F. Langford Smith, was published through the 1940’s. Earlier edition appeared in the mid-1930’s. The third edition with its 350-plus pages deals with both audio-frequency and radio-frequency applications of vacuum tubes. The most collectable edition is the fourth edition. This 1500 page manual is the ultimate tome on vacuum tube technology. The table of contents occupies 31 pages alone! Valve (tube) characteristics are covered. AF and RF information, as well as rectification, and regulation are covered. The fourth edition has a red cover. While available in re-print form, or on CD, try to latch onto an original.

Not to forget our transistor collectors out there, RCA did produce a series of transistor manuals. RCA’s “Transistor, Thyristor, Diode Manual” provided technical data for 100’s of solid-state devices. A 1973 series of manuals provided the latest information on Analog devices, RF devices and other solid-state devices offered by RCA. The mid 1960’s saw the “HB-10” series of manuals for semiconductor products. Similar to the “HB” tube series, this subscription service allowed you to keep current on their semiconductor offerings. The cover is red to differentiate them from the tube version, which has black covers.

Many of the RCA publications listed here were available to dealers for purchasing a quantity of tubes. If you had to buy them outright, the cost ranged from \$0.25 for some of the pamphlets and early tube manuals to \$2.50 for later tube manuals. The fourth edition of the Radiotron Designers Handbook sold for \$7.00. “HB” series subscriptions ran around \$20 per year. You’ll probably have to shell out a few dollars more for any of these manuals at a swap meet.

No collector’s bookshelf is complete with at least one RCA tube manual. Who knows, you might even specialize in collecting RCA tube manuals, or other publications.



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