



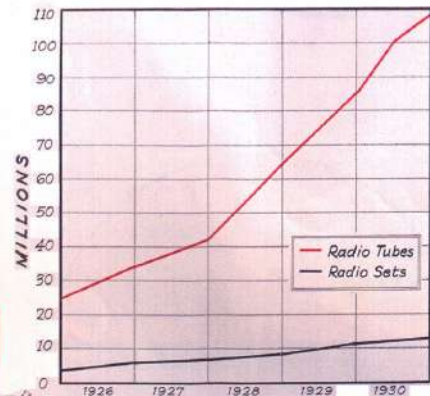
# TUBE COLLECTOR

TUBE COLLECTORS ASSOCIATION

"HISTORY • PRESERVATION • APPLICATION"

Vol. 12 No. 1

February, 2010



This chart shows the growth in the number of radio sets and radio tube sockets in use.



## Radio Tubes—The Razor Blades of the Radio Industry

A GOOD razor may last a lifetime, but you must buy new blades for it frequently. Likewise, with a radio set, the average radio set lasts for at least five years, but, if you are to get satisfactory radio reception, you must renew its tubes yearly.

It is for this reason that the tube renewal business has grown by leaps and bounds during the last few years, while the radio set business has progressed at a relatively slow rate. People do not have to buy a new radio set every year, but, hard times or good times, they must renew their tubes.

RCA RADIOTRONS - - - THE HEART OF YOUR RADIO

**TUBE COLLECTOR**  
**TUBE COLLECTORS ASSOCIATION, INC.**  
 PO Box 636, Ashland, OR 97520, USA



The Tube Collectors Association is a nonprofit, noncommercial group of individuals active in the history, preservation, and use of electron-tube technology. *Tube Collector*, its bulletin, appears six times per year.

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**Web Site:** [www.tubecollectors.org](http://www.tubecollectors.org)

**email Reflector:** [tubecollectorsassociation@yahoogroups.com](mailto:tubecollectorsassociation@yahoogroups.com)

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Group moderator: Ron Lawrence, W4RON, [w4ron@carolina.rr.com](mailto:w4ron@carolina.rr.com)

To join TCA: annual dues is \$20.00 (in North America; \$25.00 elsewhere), to the address above. Please make checks payable to "Tube Collectors Association." Payment by PayPal is welcomed, to [tca@jkasystems.com](mailto:tca@jkasystems.com). The membership year runs January-through-December. Those joining after February receive the year's back issues of TCA publications. Multi-year memberships are offered: in North America, \$37 for two years or \$54 for three; elsewhere, \$49 for two years or \$73 for three.

Articles on tube topics are invited. Editorial correspondence should go to the editor at [tubelore@jeffnet.org](mailto:tubelore@jeffnet.org) or 102 McDonough Rd., Gold Hill, OR 97525.

Renewals, changes of address, and other membership business should go to Bob Deuel at [tca@jkasystems.com](mailto:tca@jkasystems.com) or PO Box 636, Ashland, OR 97520.

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**FRONT COVER:** An RCA promo item from 1929 from their dealer publication "Good News," plugging the sale of replacement tubes. *Source: Joe Knight*

**REAR COVER:** Junior has fun while learning a valuable skill from Dad.

**MICROPHONICS FROM THE EDITOR**



**RAMPING-UP FOR CHARLOTTE**

Ron Lawrence, president of the Carolinas Chapter of AWA, has invited us to participate in the annual Antique Radio Conference that the chapter is planning for March. The venue is the Sheraton Charlotte Hotel, 1205 Scott Futrell Dr. (near the intersection of I-85 and the Billy Graham Pkwy.) (704) 392-1200. (Ask for the "Antique Wireless" rate.) The schedule is Thursday-Saturday, March 25-27. TCA will meet on Thursday morning at 9:00. Details on the overall conference, and photos of a remarkable collection of early radios and tubes that will be auctioned at the event, are available at <http://charlottearc2010.homestead.com/index.html>.

**GEORGE BADGER, W6TC**

George Badger died in November at the age of 84. On graduation from UC Berkeley in 1951, he hired on at Eitel-McCullough and held a variety of positions: running the section in the Research Laboratory that was developing the Lawrence color picture tube for production by Eimac; heading the development of power microwave tubes; ending up as Product Manager and then director of marketing. Retiring from Varian-Eimac, he became president of Svetlana Electron Devices, then went to CPI-Econco as vice president of business development and was still working there at his death.

He held seven patents on microwave tube design and an Emmy for development of the Klystrode tube used in UHF TV transmitters. A licensed amateur operator for 70 years, he held Five-Band

DXCC and Five-Band WAZ certificates.



Badger with a 3K20000 klystron early in his career, from an Eimac ad.

**TCA BOARD CANDIDATES**

We'll be having the annual election for candidates for the TCA Board of Directors in June. This is an opportunity for members who'd like to help guide the progress of the Association to help out. The required "skill set" has little to do with collecting of tubes, but calls for some imagination and business judgment. While a lot of Board business is done by email, an ability/willingness to participate in the annual

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## OLD-TIME TUBE HINTS FROM THE SYLVANIA NEWS

### SUBSTITUTING 6.3-VOLT FOR 2.5-VOLT TUBES

In modernizing old sets, I have found that hard-to-get 2.5-volt tubes can be replaced by 6.3-volt types in some sets without the expense of installing a new power transformer. The basic change necessary is replacement of the 80 rectifier with a 6X5GT. The five-volt winding is connected to the center tap of the 2.5-volt winding to get 6.25 volts. (Feb. 1947)

### TUBE SUBSTITUTION

For emergency repair, a 5T4, 5W4 or 5Y3 can be substituted for an 80 by the following method.

Cut off all pins on the substitute tube except pins 2, 4, 6, and 8. Cut off all four pins on the defective 80, taking care not to damage them. Slip the two large pins from the 80 over pins 2 and 8, and the small ones over pins 4 and 6. After carefully aligning with the octal pins, solder securely, taking care that they extend about 3/8" beyond the octal key. If carefully done, the tube will fit nicely in the old socket. (Oct. 1946)

### TUBE REPAIR

I have found that it is possible to weld the filaments of tubes such as the 12-, 35-, and 50-series by the simple expedient of a Ford spark coil and 6-volt storage battery. While this repair is not sure-fire, due to breaks occurring near the base of the tube where the filament is welded to the wire going to the base pins, it will be effective in half or possibly more cases. I have performed this operation on a quantity of tubes with very good results, and have had very few "kick-backs" and these only on 50L6s.

Practically everyone knows how to connect a spark coil up, so there would be no need in going into that. However, after hooking it up, the two top wires on the coil should be connected directly to the filament prongs of the open tube, and the

juice then turned on. If arcs are visible in the tube base, or within the tube structure, chances are that tube cannot be repaired due to the breaks being too far apart; however, if there is no arc visible, the possibility is good that the tube has been successfully welded together, which can be checked by a tube tester, ohmmeter, or insertion into the set. If a first attempt at welding a tube filament checks good, and the filament opens up again, it can be put through the process repeatedly until the weld is complete, or arcs appear, in which case the tube is "open" to stay.

This is by no means to be considered practical where replacement tubes are available but, the tube situation being what it is, it will sure help to get those dead sets off the shelf. (Nov. 1944)

### REPLACING THE BH RECTIFIER TUBE

The BH rectifier tube in some of the old-timer radios can be replaced by changing the socket and using the 0Z4 or 0Z4G. The voltage and current conditions will nearly always be within the limits of the 0Z4; however, these operating conditions should be checked to make sure that there will not be an overload on the tube. The large pins are the plates on the BH and No. 2 is the cathode. (Oct. 1942)

### CHECKING GASSY TUBES

When checking tubes on a tube tester that has a gas test, it is advisable to burn each tube about three minutes before the gas test is made. As easy way to do this, if the set is being worked on, is to turn on the set and, with all tubes burning, take them out one at a time for test. With this method the tubes are warmed up sufficiently for an immediate test. This is vitally important for testing for some abnormal condition such as fading, etc., as a gassy tube, as a general rule, will not show up gassy until it has been warmed up for about three minutes. (July 1937)

## THE BOOM OF CRT MANUFACTURE IN ARGENTINA: "TRANSWORLD ELECTRONICS ARGENTINA S. A."

Abel Santoro, LU8DXI

On September 24, 1951, LR3 Channel 7, the first television broadcast station in Argentina, was put "on air." But the real frenzy over television began here in 1960.

While television sets were manufactured here in 1954, the majority of the sets sold were imported from the USA.

At the beginning, TV sets were placed in bars and appliance shops, where the people crowded around watching the first programming. As the number of sets grew, the need appeared to rebuild or replace the picture tubes or cathode-ray tubes of these sets.

An enterprise pioneering in this field was Transworld Electronics. In the year 1961, the company installed a modern plant in the city of Buenos Aires to make and rebuild black-and-white picture tubes. This plant had machinery and equipment imported from England and was the first factory of its type built in South America.

"Transworld Electronics Argentina S. A." was located at 4643 Beruti St., Buenos Aires. Its management was headed by Mr. Gabriel Ugarte as president and Mr. Carlos Jenkins as vice president. The plant was built under the direction of the England engineer Walter Leslie Taylor, who had directed construction of several similar plants in England.

Transworld Argentina comprised only eight workers repairing the picture tubes. The production rate of was 20 tubes a day. Among these eight was Mr. Eric Heuser, who had been trained by Mr. Taylor in rebuilding techniques.

In 1964 the plant moved to a spacious building at 1368 Thames St., with some

30 technicians producing 140 tubes a day. Subsidiaries were opened the same year in Rosario, Córdoba, Mendoza and Mar del Plata, each plant with only four workers.

In the year 1965, Argentine technicians led by Mr. Heuser installed a similar plant in the Republic of Uruguay, afterward another plant in Perú and a final one in Brazil.

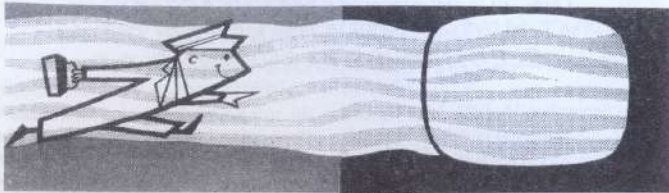
In 1966 Transworld Argentina began making new picture tubes under the tradenames "Transworld" and "Philips." The latter were made especially for Philips Argentina, which could not cover the great demand of tubes of those years. They used Corning Glass bulbs imported from the USA. The company also made picture tubes for the set factory "Panoramica" located here. The tubes carried a six months' warranty.

At end of 1965 Mr. Heuser went to Spain to install a complete factory for repairing cathode ray tubes. It was located at 49 Arquímedes St. in Barcelona.

Heuser had started work at Transworld Argentina at the start of the company and very soon became expert in rebuilding techniques. Holding 50% of the shares of the company, he was a pioneer in this electronic field. He sold his shareholding in 1976.

In 1978, with the beginning of the color-TV era in Argentina, Transworld Argentina began to rebuild color picture tubes. It and its subsidiaries closed down in 1980.

**Acknowledgement:** To Mr. Eric Heuser, who gave me the printed matter and encouragement write this article.



**TRANSWORLD ELECTRONICS ARGENTINA S.A.**

Capital \$ 5.000.000.-

AFILIADA A TRANSWORLD ELECTRONICS INC. DE WASHINGTON D.C. ESTADOS UNIDOS DE NORTEAMERICA

Planta especializada en la fabricación de tubos de rayos catódicos.

**EQUIPOS ULTRAMODERNOS**

Transworld Electronics Argentina posee una moderna planta, totalmente equipada con maquinaria importada de Gran Bretaña, para la fabricación de tubos de rayos catódicos y para la reparación de otros tipos de tubos y lámparas electrónicas.

**MATERIAL IMPORTADO**

Todos nuestros trabajos son realizados con materiales importados.

**15 AÑOS DE EXPERIENCIA**

La dirección técnica de la planta ha sido encomendada al Sr. W. Leslie Taylor, ingeniero especialmente contratado en Inglaterra. El ingeniero Taylor ha dirigido la instalación de la planta de Transworld Electronics Argentina S. A. y tendrá a su cargo la operación y control de la misma.

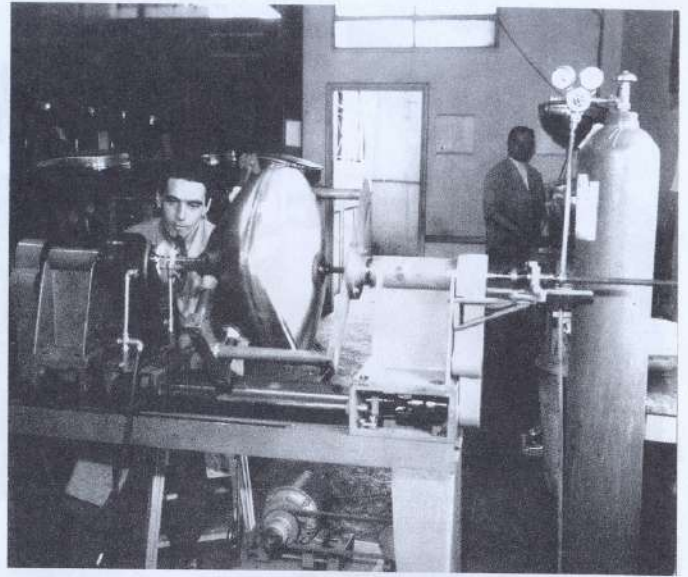
Ha ejercido funciones similares en fábricas inglesas y colaborado con los Ministerios del Aire y de Marina e Instituto de Investigaciones Atómicas Británicas.

**GARANTIA POR SEIS MESES**

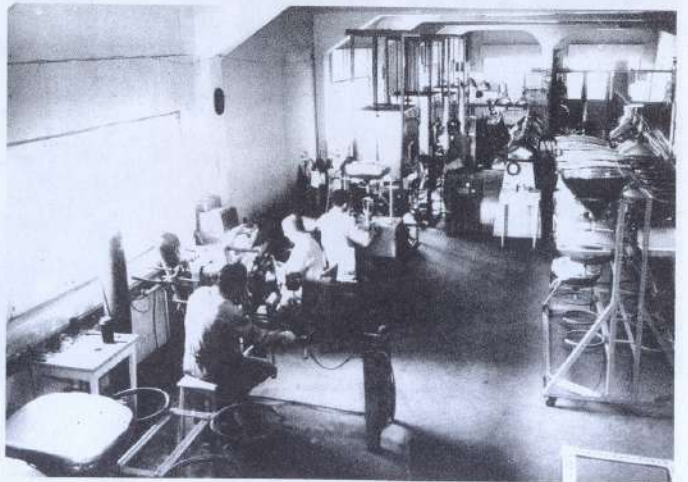
Transworld Electronics Argentina S. A. garantiza totalmente los tubos que salen de su fábrica por materiales y mano de obra y siempre que sean manipulados de acuerdo con las normas establecidas. Esta garantía es válida por el término de seis meses a contar desde la fecha de despacho.

**TW**

The front of a Transworld brochure, mid-'70s. "Affiliated with Transworld Electronics, Inc. of Washington, D. C., United States of North America. Plant [is] specialized in the fabrication of CRTs . . . Ultramodern Equipment: Transworld Electronics Argentina possesses a modern plant, totally equipped with machinery imported from Great Britain, for the fabrication of CRTs and the repair of other types of tubes and electronic lamps. Material Imported: All our work is realized with imported material . . ."

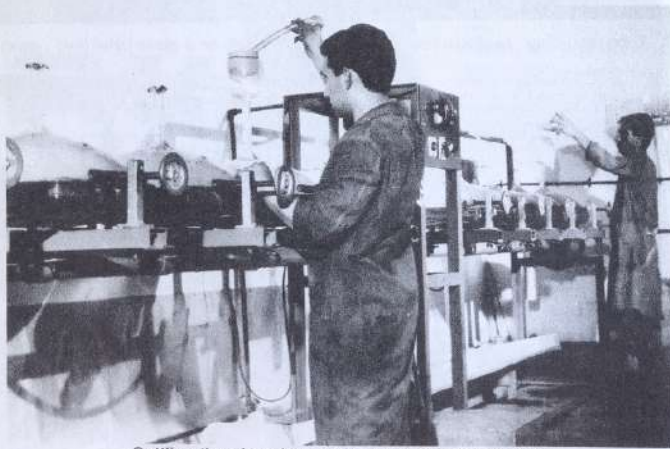


Tube-rebuilding: sealing a new neck and gun to the bulb on a glass lathe (two views)

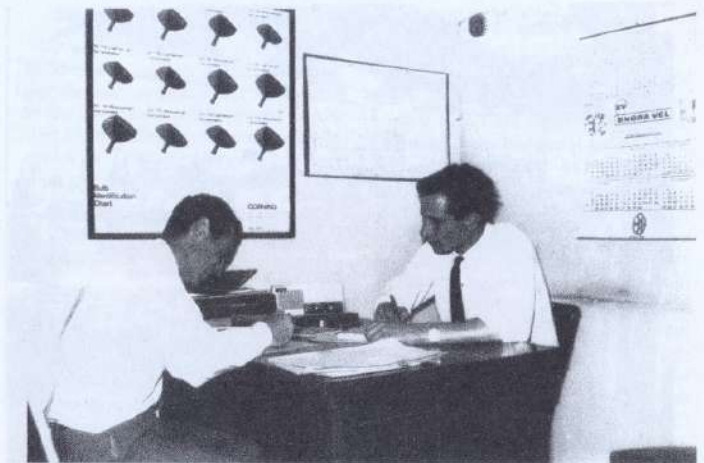




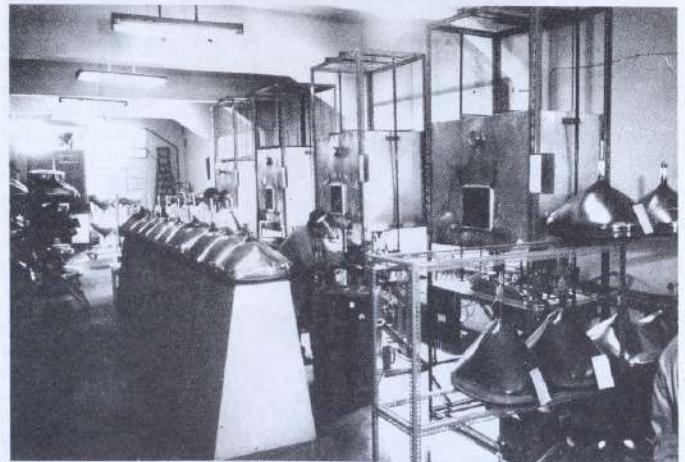
Aluminizing and lacquering the bulb



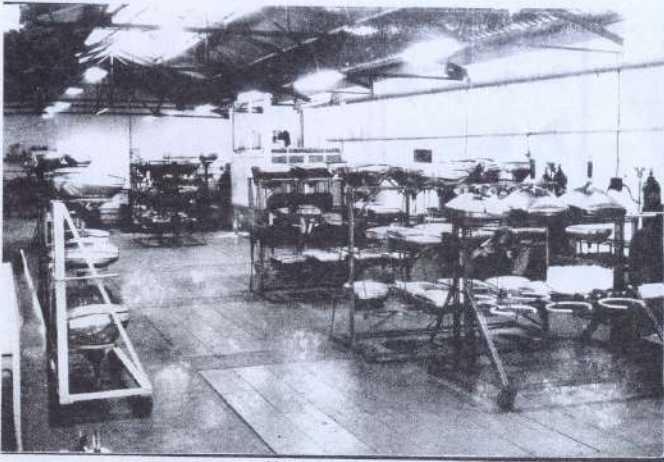
Settling the phosphor on the inside of the tube face



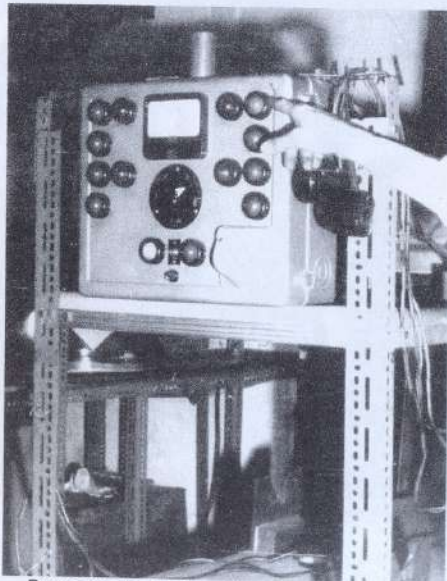
Engineers Jorge Espuyes (left) and Eric Heuser, ca. 1960.  
Note Corning Glass Works chart of 19" - 23" bulbs on wall.



Messrs. Taylor and Heuser with baking ovens



Work in process



Power supply with timer for aging finished tubes

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## A BIT MORE ON GARRETT LEWIS

We had a story ("Four Related California Tube Makers") on Garrett Lewis and the tube companies that he founded in last February's issue. It was known that he had come from amateur-radio circles in Oregon. However, a new book gives much more insight into his early career. It is Ron Kamer's *Pioneer Mikes: A History of Radio and Television in Oregon*. Here's the story, organized station-by-station:

### KDZJ EUGENE

Eugene's first radio station was the creation of Garrett Lewis, a University of Oregon student, whose license for KDZJ was granted on May 26, 1922. The station operated from his home at 1271 Emerald Street. Using the business name Excelsior Radio Company, Lewis announced plans to broadcast "assembly speakers at the University of Oregon and musical concerts held by the 'associated students' of the University." Lewis, who had been a naval operator with training in the Harvard Radio School, reportedly hadn't discussed his programming plans with the University but anticipated that "there will be no difficulty in obtaining permission [to broadcast]." By August, KDZJ was regularly broadcasting on Mondays, Wednesday and Fridays. Presumably awaiting the opening of fall University of Oregon classes (and potential programming material), Lewis was looking for partners.

Lewis' enterprise in establishing KDZJ reflected considerable initiative but apparently produced little business results. Indeed, the *Eugene Daily Guard* observed that summer that it thought the radio craze had passed. Lewis was clearly in no position to sustain the effort that KDZJ required, and he let the station's license expire in November 1922.

### KFAT EUGENE

Eugene dentist S. T. Donahue applied for a license in June 1922 and was granted KFAT on July 6 of that year. Operating from his dental office in the Zumwalt Building at 681 Willamette Street across from the Heilig Theater, KFAT was on the air before September 20, 1922, when the *Eugene Daily Guard* favorably reported on the previous day's broadcast. According to historians Will McKenzie and Gene Lane, "KFAT was more 'amateur' than professional, kept sporadic hours and was apparently operated from the dentist's office more for his pleasure than that of whatever small audience may have been listening." Since KFAT apparently began broadcasting around the time KDZJ expired, some have theorized that Lewis sold his KDZJ equipment to Donahue. This seems possible, since both stations' technical descriptions in their DOC license applications are similar. That interpretation is further supported by the report that Lewis became KFAT's chief engineer and, along with another fellow radio enthusiast Paul Hoppe, rebuilt the KFAT equipment to achieve an increase in power to 100 watts, which was later approved.

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(The book is definitely a "good read" for anyone interested in the history of broadcasting in general or in the Pacific Northwest in particular. It's orderable for \$26.95 from the JPR (Jefferson Public Radio) Foundation, 1250 Siskiyou Blvd., Ashland, OR 97520, (541) 552-6301, or via the Foundation's Web site, [www.jpr.org](http://www.jpr.org) [click on "JPR Store"] - Ed.)

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