



TUBE COLLECTOR

TUBE COLLECTORS ASSOCIATION
"HISTORY • PRESERVATION • APPLICATION"

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A vintage advertisement for TUNGSRAM tungsten filament lamps. The top half of the ad features a stylized illustration of a woman in a long red dress with a grey and purple polka-dot patterned waistband and sleeves. She is wearing a large, dark, wide-brimmed hat and looking upwards. In the background, a small town with a church spire is reflected in a body of water. Below the illustration, the text reads: "TUNGSRAM WOLFRAMLÁMPA. 75% ÁRAMMEGTAKARITÁS." followed by a small image of a tungsten filament lamp. Below that, it says "EGYESÜLT VILÁMOSSÁGI IZZÓLÁMPA ÉS RÉSZVÉNYTÁRSASÁG UJPEST 4." and "FARACO CO." in the bottom left corner. In the bottom right corner, it says "GRAPHICAL INSTITUTE P.L. BUDAPEST."

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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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. 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 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 or PO Box 636, Ashland, OR 97520.

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FRONT COVER: Inspired by February's "Tungsram Radio" ad, Abel Santoro sent in this advertisement, clearly from the Hungarian arm of the company, for tungsten-filament light-emitting monodes.

REAR COVER: In the Dec. 2008 issue we had an article, "The Elusive Lestron," on a 1930-vintage tube designed to be heated with 110-volt line current. There was doubt at the time that the tube had ever gone into production, considering that a couple of major collections do not include a sample. However, here's an "existence proof": author-collector Keith Thrower has one! It was found at a collector flea market, housed in a light-bulb carton, and was originally thought to be a lamp. However, it appears to be a triode. How it got to Britain is a mystery.

MICROPHONICS FROM THE EDITOR



marking the 150th anniversary of de Moura's birth. (For details, see J. P. Ryback's article in the Feb. 2002 *Old Timer's Bulletin* or Fazano's Brazil story in *TC* for June 2009).

2011 MEMBER MEETING

Our 2011 event will take place on the afternoon of Thursday, July 7, at the Causeway Bay Inn (formerly Holiday Inn), Lansing, MI. The Michigan Antique Radio Club has invited us to meet just before their long-running and successful "Extravaganza" event on Friday and Saturday. Fuller details will follow.

We expect to follow the format of the 2009 meeting, held at the same place. See the description in *TC* for Oct. 2009, pp. 5-7. The article cites some of the more interesting tubes that turned up in the Extravaganza flea market.

BOARD ELECTION COMING UP

We'll be having an election to fill a position on the TCA board of directors in June. Jim Cross is in charge of developing a slate of candidates. Members who would like to participate in guiding a reasonably smooth-running organization are welcome to contact him. The requirements are reasonable ability to attend a yearly meeting and provide ideas (having a spiffy tube collection is not needed!).

FUN WITH BULBS

Tube Collector, oddly, has never had a feature on incandescent lamps, which are, after all, vacuum tubes. We're fixing that with this issue with two articles!

BRAZIL CELEBRATES LANDELL de MOURA

Carlos Fazano reports that the Brazilian post office has just issued a stamp honoring Fr. Roberto Landell de Moura, their inventor-priest who received local and U. S. patents on a wireless telephone - telegraph system in 1900-02. The date was Jan. 21,



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TUBES RCA MADE IN CHILE

The "Victor Talking Machine Company of Chile" was established in 1927. Its location was at the intersection of Chacabuco and Rosas streets in Santiago County. It began making phonograph records and Victrolas under licence from the Victor Talking Machine Company of Camden, New Jersey, USA.



Fig. 1. Personalized tube. Note the "Made in Chile" stamping.

When the Victor Company was acquired by the Radio Corporation of America in 1929, the company in Chile changed its name to "RCA Victor Chileña Inc." It moved in 1932 to No. 1680 Vicuña Mackenna St., Santiago town. Later the name became "RCA Victor Chileña S. A.," continuing at the same address. In 1938 a new move took it to No. 3333 on the same street. All of the stock in "RCA Victor Chileña S. A." was held by the U. S. RCA.

In 1939, under the growth plan of the Chilean president Pedro Aguirre Cerda, the company changed its name to "Corporación de Radio de Chile" (CRC), with 66% of the stock owned by the U. S.

RCA and the remainder held by the "Corporación de Fomento de Chile" (CORFO, or Chilean Promotion Corporation).



Fig. 2. IRT plant in Santiago, 1975

Production of radio receivers and turntables also began in 1939. The electron-tube division inside the company was inaugurated in October, 1956, with production beginning at the end of the year.



Figs. 3A and 3B. Chilean tubes with familiar RCA graphics. The lower one is a late-vintage 80 in a T9 bulb.

A technical chief of the electron-tube division was an engineer, Mr. Armando Vallarino. At that time he was 36 years old, and today he tells us that when tube

production began, the works manager gave him and each supervisor of the tube division a tube with the name of each chief painted on the plate. See the "cage" of the tube in Figure 1. Armando Vallarino left the "Corporación de Radio de Chile" as a senior manager in September, 1964.



Fig. 4. A package of needles, "made with actual cactus spines, selected and specially treated." The bar-shaped object appears to be a bit of sandpaper for sharpening them.

The "good old days" of the "Corporación de Radio de Chile" were between 1950 and 1960, when the manufacture of TV sets began under the trade mark RCA, but manufactured by "Industrias Nacionales Leopoldo Sanz." Those receivers were made with electron tubes that RCA made in Chile but with cathode-ray tubes produced by Philips, also in Chile. Later the "Corporación de Radio de Chile" made its own black-and-white picture tubes.

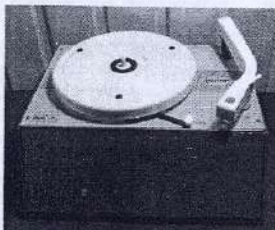


Fig. 5. V-10 phono

In 1970 the "Corporación de Radio de Chile" was renamed "RCA S. A." In 1971 the Chilean government intervened, partially separating the company from the U. S. RCA, and naming it "Industrias de Radio y Televisión" (IRT), with a subsidiary in Arica County named "ILESCO," in which were made radio receivers, turntables and TV sets. These used

electron tubes made in Chile, under licence from RCA USA, but trademarked "IRT."



Fig. 6. RCA Victor 526X

In the "IRT" factory in Santiago town there were some 800 workers and at the "ILESCO" factory about 200 more, the majority being women. In this latter factory was made the famous 12" black-and-white TV set named "Antú," assembled totally in Chile. Also in this factory were made vinyl records (singles and long-play), until 1980, when the recording division closed down. However, after the shutdown of this division, vinyl records were again made in Chile by the company "RCA Records," running from 1982 to 1991.



Fig. 7. ILESCO plant

In 1972 the manufacture of electron tubes ceased. Later (1980) "IRT" closed down and was purchased by "Radio Center Ltda." (RCL), an importer of electronic products.

Figure 2 is a photo of the building located at No. 3333 Vicuña Mackenna street in Santiago, as of 1975.

Figures 3A and 3B show some valves RCA made in Chile and their cartons. Figure 4 shows a curiosity: needles for 78-RPM phonographs. Made by RCA in Chile, these were manufactured with cactus spines which were longer than similar needles made in steel, of which one can see at right in the figure.

Figure 5 depicts the "RCA Victor Victrola Junior V-10," made in the '60s by the "Corporación de Radio de Chile." This simple two-speed turntable lacked a top cover, and used the tubes 50EH5 and 35W4. It was made for 220-V, 50-Hz power.

Figure 6 shows the RCA Victor 526X receiver which was assembled by the "Corporación de Radio de Chile" in the '50s, with a chassis imported from the USA. The bakelite cabinets were molded in Chile. This receiver was a Chilean version of the "Little Master IV" model sold in the USA. It was made for long-wave (550-1600 kHz) only and had a phono connector on the rear panel. It

drew 48 watts at 220 V AC-DC. It used the tubes 12SK7, 12SQ7, 12SA7, 50L6GT, and 35Z5GT. [This puts the notion of "All-American Five," familiar to U. S. readers, in a new light! - Ed.]

Figure 7 shows the building of "ILESCO," the subsidiary of "IRT," located at No. 23, Panamericana Route, Arica County.

ACKNOWLEDGEMENTS:

To Mr. Julio Mazzaro, who did good work in processing the photos. To the Chilean citizens Mr. Armando Vallarino and Mr. Sergio Hernán Saavedra Sandoval for sending information and photos of the properties, and granting publication clearance.

RCA VIEWS TELEFUNKEN 12AX7s

Ludwell Sibley

There's always been a lot of buzz in tube-audio circles around the Telefunken version of the 12AX7 preamp tube. Some of it is sound-and-fury. But there may be some substance in this area. Here's a bit of evidence from RCA.

In 1962, H. W. McCord, a Tube Division engineer, wrote an eight-page "Coded Engineering Letter 653 - #806," titled "Flicker Noise Test."

The report described a test set for measuring the noise generated in a tube at very low frequencies, as opposed to shot noise in the tube or thermal noise in the circuit components.

The motive for the investigation was complaints from "manufacturers of medical and geological recording systems and of radio broadcasting and other high quality audio equipments. Flicker noise is of interest in the Sonobuoy nivist, and the military is concerned with [it] in infrared detection equipment."

In the test system, the output of the tube under test went through a three-stage amplifier. It then fed a bandpass filter (center frequency 10 Hz, bandpass six Hz at three dB down) and drove a vacuum-tube voltmeter. The voltage measurements were converted to Equivalent Noise Resistance ("that value of resistor which produces thermal noise voltage equal to the equivalent noise voltage of a tube, referred to its grid"), the lower the better.

The tube under test, and the following amplifier, were powered by 12-volt and 90-volt batteries, and housed in a screened room, to control hum and noise.

The report gives test results for a variety of tubes. Quoting, "Readings on Telefunken and RCA 12AX7s and several RCA Nuvistor types are shown . . . As usual, Telefunken is our model (emphasis added), with Rn values largely below 7500 ohms. All of the RCA 12AX7As were above 100K."

The summary of the report reaffirms "Telefunken 12AX7s are very good for flicker noise, largely below 7500 ohms. RCA 6CW4s are very good also. Other tubes read so far are not impressive."

Here are more results from the report:

Type	Samples	Resistance, kilohms		
		Min.	Median	Max.
TF ECC83/12AX7	20	5	7.5	80
RCA 12AX7A	11	110	230	1200
RCA Nuvistors				
6CW4	6	9.3	10	114
7586	6	28	50	170
7895	6	11.5	20	50
8056	6	30	70	170
A15133	6	80	200	550

Anyway, enjoy those Telefunken 12AX7s in your stereo. They may in fact be superior!

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REJUVENATION OF VACUUM TUBES

Lane S. Upton

This classic article, reprinted by permission, originally appeared in the Dec. 1973 issue of the *AWA Old Timer's Bulletin* (now *AWA Journal*). The techniques that it describes are as valid now as then. Upton was a test-systems engineer at Eimac - Salt Lake and knew the tube business. - Ed.

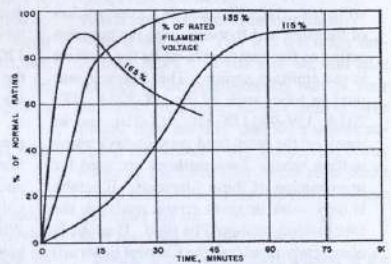
With the ever-increasing scarcity of the old tubes, it is becoming more important that we try to save as many as possible. Over the past two years the author has been experimenting with the rejuvenation of these older tube types. This work has been based primarily on present-day techniques used at Eimac and on data given in various books published during the 1920s. Using the methods described herein, the author has had approximately 85% success in returning inactive tubes back to useable transconductance. The failures have primarily been due to filaments being burned out during the application of the excessive voltages required. The tubes which failed either had filaments that had been weakened from long hours of operation, or were marginal at the weld joints. None of these failures were opened for investigation, as they are still valuable for display purposes.

The primary failure mode of these older tube types is a loss of electron emission from the filament or cathode. With the wide inter-electrode spacings used in these tubes, a short is very rare except in the case of a broken filament wire or where the oxide has flaked from the filament or cathode and has touched the grid. The loss of electron emission typically shows up in the tube tester as a weak tube or one which will not raise the meter needle. If a tube tests normal and does not show any erratic indication on the test meter, no attempt should be made to improve it by rejuvenation.

The equipment required for rejuvenation is relatively simple. In addition to a tube tester, a variable filament supply is required with a meter of reasonable accuracy for measuring the applied voltage. In place

of a separate filament supply, a filament voltmeter may be connected to the tube tester and the filament-voltage switch and "line" adjustment used for voltage control.

For the thoriated tungsten filaments it is preferable that no grid or plate voltage be applied during rejuvenation. With the oxide-emitter tube, voltages should be applied during rejuvenation. The removal of plate and grid voltages can be readily accomplished by the construction of an adaptor socket with filament connections only. The voltage applied to the filament during rejuvenation must be carefully controlled to the values given herein. The accompanying graph shows the results of various voltages applied to a thoriated-tungsten filament dur-



ing rejuvenation. It shows that a voltage lower than the recommended value will eventually result in a tube which will remain weak.

Emission loss is generally due to contamination (poisoning) of the emitting surface. The vacuum and the original outgassing of the elements in these older tubes was not near present-day standards, therefore, they contain considerable residual gases. The poor emission usually is the result of either the emitting surface being poor prior to storage, or, immediately upon being heated the filament / cathode was poisoned by the re-