

# TUBE COLLECTOR

TUBE COLLECTORS ASSOCIATION  
"HISTORY • PRESERVATION • APPLICATION"

Vol. 14 No. 3

June, 2012

**CITIZENS RADIO  
TRANSCIVER USES**

*Sylvania  
sub-miniature  
tubes!*



The farmer in the field and his wife at home will be able to converse with ease by using these new, lightweight transceivers equipped with Sylvania sub-miniature tubes!

Tiny Sylvania sub-miniature radio tubes, smaller than a lady's little finger, are big reasons why the Citizens Radio Transceiver measures only 6" long, not quite 3" wide, 1 1/4" deep, and weighs only eleven ounces!

Sold in sets of two, these tiny two-way transceivers with a range of several miles are tuned to 465 mc. Among the many who want these handy units are police and fire departments, surveyors, farmers, hunters, industrial users, rangers and those who wish boat-to-home and auto-to-home communications.

Sylvania's extensive radio tube research and manufacturing skill have made Sylvania sub-miniature tubes the choice of Citizens Radio Corporation, Cleveland, for this revolutionary, civilian transceiver. Sylvania Electric Products Inc., Radio Tube Division, Emporium, Pennsylvania.

**SYLVANIA  
ELECTRIC**

RADIO TUBES; CATHODE RAY TUBES; ELECTRONIC DEVICES; FLUORESCENT LAMPS, FIXTURES; WIRING DEVICES; LIGHT BULBS; PHOTOLAMPS



**ZENITH.**



**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](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 membership is invited, at: 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 welcomed. 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:** A classically styled promotion poster for the Italian tube maker Zenith, with factory located in Monza. Beginning about 1929, it made a line of European- and American-designed receiving tubes. The original art is 10" by 15-1/2". It has been reproduced as a lithograph on steel and in a book on old-time posters.

**REAR COVER:** An ad (*Communications*, Feb. 1949) for tubes used in a primitive transmitter for the original (460 MHz) Citizens Band. One suspects that the set used one tube as a modulated oscillator on transmitting and a superregenerative detector on receiving, with a second tube as modulator / audio amplifier. The Citizens Radio Corporation is not a widely recognized name in CB gear.

**MICROPHONICS FROM THE EDITOR**



**2012 TCA MEMBER MEETING**

The TCA Board has affirmed the choice of venue for the annual Member Meeting: the Old Sams Valley School outside Gold Hill, OR. This is the same site as was used for the 2010, 2008, etc. meetings. We'll have more details in the August issue.

**CHARLOTTE MEET WINS**

TCA held a meeting for tube enthusiasts by invitation of the Carolinas Chapter of AWA at the Sheraton Charlotte Airport Hotel in North Carolina, on the morning of Thursday, March 22. This year's CC-AWA event also hosted the Charlotte International Cryptologic Symposium, which drew 15 participants from England and Europe alone and featured a jaw-dropping display of classic cryptographic equipment with a full schedule of talks.

The TCA event was the usual small-but-intense format. Jim Cross ran the meeting in place of Ludwell Sibley, who was unexpectedly unable to attend. Jim briefly described the state of the Association and managed the session. Robert Lozier, Kirk Cline, and Bob Dobush gave short tube-related talks and demonstrations.

The CC-AWA übermeet was the usual success. Registration reached 303, with a vigorous flea market drawing 120 vendors in fine weather. Tube-searchers like Cross and Ron Lawrence reported some choice "finds." The antique-radio auction lasted four hours and featured some good buys.

**TCA BOARD MEETING**

The TCA Board held a somewhat belated "meeting-by-email" lately, to substitute for a physical meeting that had proven impractical to arrange. It drew upon written-ports previously submitted by Secretary-Treasurer Deuel and Editor Sibley. Deuel

reported the re-election of Ron Lawrence for another Board term. The participants chose to re-elect the present officers to fill their posts until the 2012 meeting, which is expected in October. Deuel reported a healthy financial position at the start of the 2011-2012 fiscal year, with funds totaling \$20,994.11. The previous year's expenses were \$11,305.31, vs. income of \$11,761.82. As always, the principal expenses were postage and printing, while income was mostly from member dues.

Per Deuel's tabulation, membership totaled 382 as of July 1, 2011 (329 in North America, 53 elsewhere).

The publications situation remains healthy, relying on member contributions, locally generated articles, and old-time material. The Data Cache DVD-ROM set, expanded to include tube registrations dating back to the beginning in 1933, continues to attract buyers. Besides the Special Publication on the Gammatron (No. 21), another is expected for sure in the fiscal year and three more are in various stages of preparation.

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## THE LANCASTER RCA TUBE PLANT (A VIEW FROM THE YEAR 1948)

Prepared by **Abel Santoro, LU8DXI**

The most modern electron-tube and television picture-tube manufacturing factory was located in Lancaster, Pennsylvania. This plant was built by the Radio Corporation of America, for the U. S. Navy Department, and its completion was in December of 1942.



An early aerial view of the plant

During WW II, this plant was operated by the RCA Victor Division and produced huge quantities of power tubes, cathode-ray tubes and special-purpose tubes used in weapons and military communications. In September of 1943 the Lancaster plant attained the production rate to which it was committed, with peak production reached in June of 1944. The plant was the largest in existence for the manufacture of picture tubes used in television receivers and television camera tubes at that time.

From October of 1941 to the peak at June, 1944, RCA expanded its production of cathode-ray tubes 29.6 times; pickup tubes 27.1 times; power tubes 4.4 times; and special-purpose tubes 3.7 times. During the war the Lancaster plant was RCA's single supplier of cathode-ray and power tubes for war-critical radar, SHORAN (Short Range Navigation), LORAN (Long Range Navigation), radio altimeters and airborne television used by the armed services. Other products made were high-sensitivity multiplier phototubes and high-frequency magnetrons.

The plant stood on a tract of 99 acres. It contained 396,000 square feet of floor space, with personnel of about 1000 workers, the majority being residents of Lancaster.

In the year 1946, the RCA Victor Division bought this tube plant from the Navy Department for \$4,362,500, with

additional investment made by the RCA Tube Department of \$2,000,000 to modernize the plant with high-speed production equipment intended for the manufacture of receiving electron tubes and all types of cathode-ray tubes for television purposes, radio broadcasting and large power tubes for industry.

The main building of the plant accommodated nearly all of the tube-production operations, offices, a complete engineering laboratory, warehouse space, and a cafeteria.



(From the left) E. M. Wood, manager of manufacturing; J. A. King, plant manager; Dr. D. Ulrey, manager of the engineering department.

In another building was the luminescent-materials laboratory where RCA made its own cathode-ray screen coating materials.

This plant had its own sources of hydrogen, oxygen and liquid air, gases used in tube manufacture processes.

Other buildings in this plant were a fireproof solvent-storage building, a modern building for engineering development of large power tubes (the "super-power" program) and all-weather tennis courts on the grounds.

In 1948 the Lancaster tube plant was expanded, involving more than a million dollars, a large number of automatic tubemaking machines were installed in a new building with an area of 40,000 square feet and 1600 people were employed in tube manufacture at the start of the year 1948.

The following photos give a factory tour as of 1948.

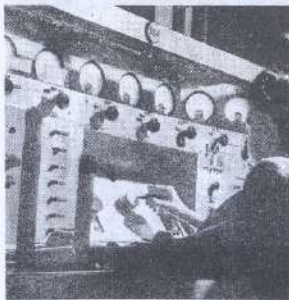
Acknowledgement: To the Department of Information of the Radio Corporation of America, U.S.A.



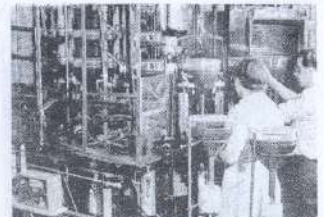
Cathode-ray "gun" is added to an image-orthicon camera tube.



An operator pours phosphor solution into 7-inch picture tubes.



Final checks on small cathode-ray tubes used in servicing radio and electronic equipment.



At this automatic exhaust machine, the air is completely removed from the kinescope before "tipping off" or sealing the stem.



In an operation which requires dexterity and patience, RCA employee Edna Burkhart assembles an image-orthicon camera tube.

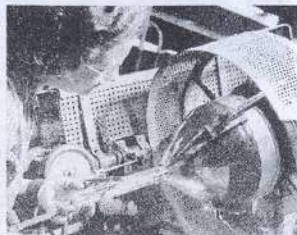


Racks of cathode-ray tubes move down one of the production lines.





Checking picture tubes during a 500-hour continuous test.



Nonreflecting carbon coating ("Aquadag") is applied to interior of the tube by a long-handled brush to keep stray electrons from the picture screen.



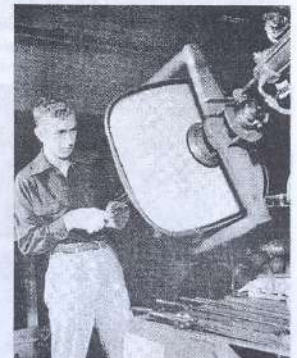
Making final tests on 10-inch kinescopes using a special chart as a reference standard.



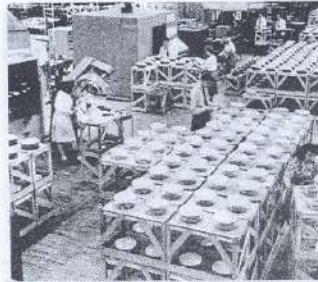
Operators prepare the fluorescent solution which forms the picture screen.



Operator threads lead-in wires into the base of a kinescope, after air has been exhausted.



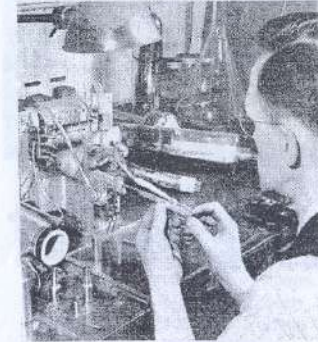
In making a picture tube, the kinescope is whirled rapidly while a graphite coating is applied to the inside of the glass neck and metal cone.



Racks of kinescopes await final processing and tests.



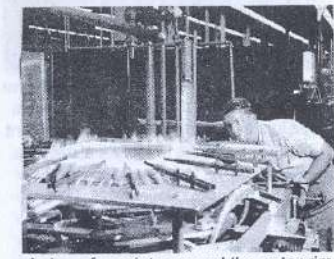
Worker examines a mesh screen, to be used in an orthicon, for blemishes.



Assembling the electron gun for a cathode-ray tube, which is the heart of a radar indicator.

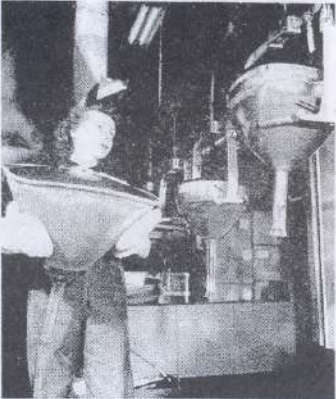


An inspector examines the assembly of an electron gun, to assure that this fundamental element of a picture tube meets rigid specifications.



A ring of gas jets around the outer rim of a tube fuses the glass faceplate to the kinescope's metal shell.

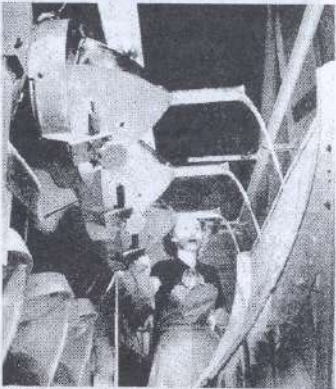




An RCA employee loads metal-shell picture tubes onto the overhead conveyor system.



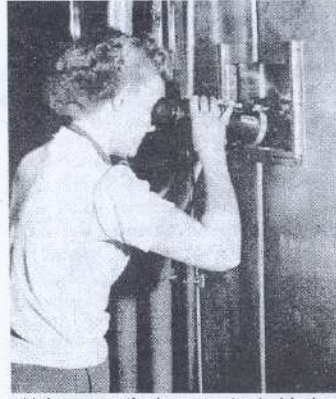
This fork-like instrument, guided by a worker, lifts a hot tube onto a cooling belt.



At the terminal of the "settling belt," the water of the phosphor solution pours out into a spillway, leaving a fluorescent coating inside the faceplate of the tube.



A phosphor solution is poured into a kinescope which is then placed on a moving belt where the phosphor settles out to form the tube's picture surface.



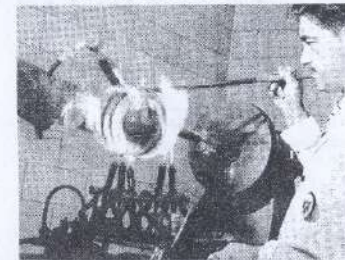
Using an optical pyrometer behind a protective shield, a worker measures the heat intensity of gas flames during the metal-to-glass sealing operation.



Exposure to a powerful light allows this inspector to give the screen surface of the picture tube a final inspection before shipment.



Faceplates of metal-shell and glass rectangular kinescopes are carefully cleaned before the tubes move on to the next step in production.



Under the intense flames of gas burners, the glass face is sealed to the back of a camera tube.

The Lancaster facility was acquired by Burle Industries, Inc., a firm formed by a management buyout after General Electric took over RCA in 1986. Burle continued to produce the RCA line of "Cermolox" ceramic power tubes (in 2 watt to 2-mega-watt ratings), a group of high-power magnetrons for RF-heating use, and the family of photomultipliers. Besides Lancaster, Burle has English, Mexican, and German locations. - Ed.