



Volume 33, Number 1

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Journal of the  
**CALIFORNIA HISTORICAL  
RADIO SOCIETY**



*Dennis Netto*



*Mike Sugerman*



*Mike Pechner*



*Bobby Ocean*



*Jane Morrison*



**2013  
INDUCTEES**



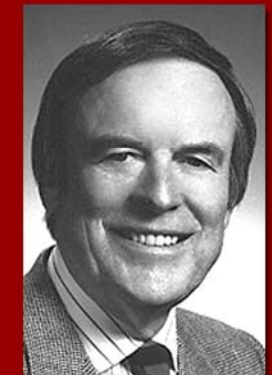
*Henry Leff*



*Roy Trumbull*



*Barbara Taylor*



*Bill Weaver*



*Dan Rusanowsky*

FOR THE RESTORATION AND PRESERVATION OF EARLY RADIO



FROM THE BIRTHPLACE OF BROADCASTING  
**CALIFORNIA HISTORICAL RADIO SOCIETY**  
 HOME OF THE BAY AREA RADIO MUSEUM & HALL OF FAME

The California Historical Radio Society (CHRS), is a non-profit educational corporation chartered in the State of California. CHRS was formed in 1974 to promote the restoration and preservation of early radio and broadcasting. Our goal is to enable the exchange of ideas and information on the history of radio, particularly in the West, with emphasis on collecting, preserving, and displaying early equipment, literature, and programs. Yearly membership is \$30.



**CHRS Museum at Historic KRE**

CHRS has been fortunate to occupy and restore the historic KRE radio station building located at 601 Ashby Avenue in Berkeley, CA. The KRE station has been an important landmark in S.F. Bay Area radio history. Originally constructed in 1937, the KRE station was one of the first facilities built in California specifically for broadcasting. The KRE site has been transmitting AM radio signals for over 70 years and still operates today as KVTO. In 1972, it was the location for scenes featuring “Wolfman Jack” and Richard Dreyfuss in the George Lucas film, “American Graffiti.” CHRS has been proud of its restoration of the station plus its creation of a museum and educational center; it has given us an environment to share our knowledge and love of radio and it has enabled us to create an appreciation and understanding for a new generation of antique radio collectors and historians. Unfortunately, due to a change in KRE ownership, CHRS is having to bid farewell to KRE and move the museum and educational center to a new location.

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- Dale Tucker – Sacramento Chapter

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- Steve Kushman – President, KRE Project Manager
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- Paul Shinn – Amateur Radio Operations
- David Vasquez – Electrical Transcription Project
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## Contents of the Journal

### COLUMNS

- 4 **From The President**  
Steve Kushman
- 5 **CHRS Sacramento Chapter News**  
Dale Tucker
- 6 **CHRS Central Valley Chapter News**  
Scott Scheidt

### FEATURE ARTICLES

- 7 **The 2013 Bay Area Radio Hall of Fame Inductees**  
Ben Fong-Torres — from his “Radio Waves” column in the SF Chronicle
- 8 **Remembering KRE**  
Photos by Mike Adams, article by Richard Watts
- 17 **Radio Spies: Early Israeli Signal Intelligence Work**  
Bart Lee
- 20 **Rejuvenating Thoriated-Tungsten Tubes**  
Norm Leal
- 21 **Replacing Transformers Having 2.5 Volt Windings**  
Norm Leal
- 22 **Replacing Eyelet Riveted Dial Covers**  
Mark Palmquist
- 24 **Shellac — A Traditional Finish Yields Superb Results**  
Jeff Jewitt
- 34 **The 2013 CHRS Restoration Contest Results**  
John Staples

On the Covers: (front) The 2013 Bay Area Radio Hall of Fame inductees  
(rear) 2013 CHRS Fellowship and Award recipients

### From the Editor

Once again I've had the pleasure of working with very generous and capable contributors. I want to thank Jeff Jewitt, Mark Palmquist, Norm Leal, Ben Fong-Torres, Mike Adams, Bart Lee, John Staples, Dale Tucker, Scott Scheidt and Steve Kushman.

Member feedback shows there is much interest on wood cabinet refinishing and I had a lot of positive feedback regarding the in-depth article on the application of lacquer. As a result, this issue includes a second in-depth tutorial article this time on the use of shellac from Jeff Jewitt, a noted author and expert in wood refinishing.

It is my desire to continue to improve this journal and provide you with relevant high-quality content. To do this I need your constructive comments. And if you would like to contribute an article in a future issue, please let me know.

Richard Watts, [jrchr@comcast.net](mailto:jrchrs@comcast.net) ◇

## From The President

by Steve Kushman

*Happy 40th Birthday CHRS!*



In 1974 a small group of electrical engineers and technicians in the Electronics Gulch, later to be called Silicon Valley, who were antique radio collectors decided to organize. These seven collectors realized the importance of preserving radio artifacts and the history that accompanies them. They called themselves the California Historical Radio Society, were chartered as an educational non-profit corporation, wrote by-laws, and secured a 501(c)(3) IRS status. CHRS was born.

Our founders were Jim Cirner, Norm Berge, Gene Rippen, Dave Brodie, Robert Middleton, Ken Miller and Peter Brickey. Larry LaDuc was the first historian. They had the foresight to organize and create an environment for individuals with similar interests to gather and exchange ideas about radio collecting and preservation. The first year, CHRS had about 25 members; today we have close to 400.

In the second edition of the CHRS Journal in 1974 there was a small note that said the new home of the CHRS Museum would be announced soon... that was 1974. In the blink of an eye, 30 years had passed. CHRS was getting along just fine. We held many swap meets at Foothill College, Ampex and other venues in the area. We even survived the onslaught of eBay. Our members loaned artifacts for museum exhibits at the San Francisco International Airport, the Monterey County Executive Airport, the Gavin Seminars and others.

Fast-forward to 2003. This is when we met Jaime Arbona. A mutual friend introduced me to Jaime. He was a new radio collector who had a few sets. He saw my collection, joined CHRS and caught 'radio disease'. He knew that CHRS had its eyes open for a building for years and told us about the old KRE building in Berkeley. Jaime's company, InLanguage Radio, was programming KVTO-AM, the former KRE-AM. The studios and offices had moved out 9 years before, leaving an empty graffiti painted building with a working, remote controlled transmitter. Starting in 2004, in exchange for restoring and maintaining the building and the grounds, CHRS was able to secure a 10 year 'license to occupy' this historic building from the owner of KVTO, Inner Cities Broadcasting Company.

The CHRS Vintage Radio Museum was created ... but not without the tireless efforts by a group of dedicated and passionate volunteers who turned this dilapidated and junk filled building into a showplace for the CHRS collections and Radio Hall Of Fame. Building Operations Managers, Robert Swart and Walt Hayden and Landscaping Operations Manager Larry Drees set a high bar for quality in every project from painting to building display spaces to trimming trees and keeping the grass mowed and neat.

Fast-forward another 10 years. During this period, CHRS changed ... Forever. We evolved from a 'collectors club' meeting in parking lots into a true 'historical society'. Yes, we still support our collector's events, but being in a building has allowed CHRS to grow and expand our horizons. Traditionally, our main emphasis was mostly radio receivers and their technology but now we present and display radio broadcasting gear as well. We inherited W6CF, the Jim Maxwell Station, and the extensive and deep Maxwell Communications Research Library. We have built a world-class collection of equipment and artifacts dating back to the early days of the 20th Century. CHRS now teaches classes in radio history, repair and restoration. CHRS has a complete radio repair and restoration shop. We digitize vintage audio formats and Electrical Transcriptions.

In 2010, the on-line only, Bay Area Radio Museum and Bay Area Radio Hall Of Fame merged with CHRS. Now, in addition to the technology, CHRS also celebrates the personalities and stations with biographies, histories and audio clips that have made Bay Area Radio such an important part of our lives. Previously on-line only, CHRS now proudly displays the Bay Area Radio Hall Of Fame on its' walls. We record and present the histories of our personalities in our Living History Series.

In 2012 the Society Of Wireless Pioneers merged with CHRS bringing us rare historical archives dating back to the late 1800s. SOWP was the organization that represented CW or wireless Morse code operators. For 100 years they were the backbone of the commercial communications industry and at one time had 5,000 members.

CHRS is now publishing two fine full-color CHRS Journals per year packed full of historical information. Our excellent Journal Editor Richard Watts has also re-mastered the long out of print, "Behind the Front Panel." CHRS worked in conjunction with noted radio historian, John Schneider, on the Arcadia book, "Bay Area Radio." CHRS Historian, Bart Lee has compiled the autobiography of CHRS Member and principal in the Sargeant-Rayment Company, Will Rayment. And, Chairman Mike Adams has written the definitive book on the life and times of Lee de Forest. Few vintage radio organizations offer as many diverse programs and activities as CHRS.

During our occupancy of KRE we were constantly reminded about the importance of owning our Museum. So, we agreed to buy the building and land from Inner Cities Broadcasting, allowing their transmitter to remain. Then Inner Cities filed for bankruptcy. In June 2012 CHRS was offered the opportunity to purchase the building and land from the receiver of the bankruptcy. We started raising money in donations and pledges. While the bankruptcy dragged on we continued to fund raise and after a little over a year we had raised \$690,000. Then unexpectedly, new owners of this property withdrew the offer to sell the building to CHRS and asked us to vacate... by March 1<sup>st</sup>, 2014.

Well, your favorite vintage radio organization was in an awkward situation. We now owned a world-class radio collection and library and needed to move. So, the search for a permanent home began. We wanted to stay in the Central Bay Area. Dennis Monticelli took the point and spearheaded a wide search. 2152 Central Avenue in Alameda was found. The asking price was \$975,000. This was \$225,000 more than we were going to raise to buy KRE, but this was a good building in a very good location and worth pursuing. With Denny's guidance CHRS made an offer that was accepted.

The Sunset Telephone and Telegraph Company built 2152 Central Avenue in 1900 where it served as one of the first telephone exchanges in Alameda. It is a 7,400+ square foot single-story building with a full basement. We only had 4,600 square feet at KRE. It is in a great neighborhood a couple of blocks from Downtown, easy to get to, and easy parking. There is a driveway down one side and room in the back for several cars or outbuildings. There is a 45 car parking lot adjacent to the building, owned by the Central Baptist Church, that CHRS has been given permission use.

As CHRS went into escrow for the purchase our fund raising ramped up. Pledges were called in and many were doubled. Donations poured in reflecting the confidence in CHRS. Through the passion and dedication of our members and supporters CHRS raised over \$1 Million! The next Journal issue will include a list our generous donors.

2152 Central Avenue is a telephone building and has no prior broadcasting history, but it fulfills our requirement to have a permanent home. It will allow us to continue all of our activities and programs and to grow as an organization. We will recreate the KRE studio and control room in this building. We are going to sacrifice our historical location in exchange for a permanent, larger, and more practical one. Because, the reality is, we are now responsible for an important collection of artifacts and historical archives that must be protected and preserved.

CHRS learned much and grew a lot during our years at KRE. See Richard Watts' and Mike Adams' great photo essay of our time at KRE in this Journal. Now we will apply that growth and knowledge to create our new 'Radio Central'.

So, *HAPPY 40<sup>th</sup> BIRTHDAY CHRS!* Our members and supporters have given this very fortunate vintage radio society quite a Birthday present! I am humbled and proud to be part of such a fine dedicated group. Our volunteers are second to none and have made CHRS the successful organization that it is. In our next issue I'll write about these wonderful people who are ready to build the new 'Radio Central'.

Finally, after 40 years, we can say that CHRS is pleased to announce that on April 23<sup>rd</sup> 2014, **the new permanent home for the California Historical Radio Society Museum and Educational Center for Radio and Radio History will be, CHRS 'Radio Central', 2152 Central Avenue in historic Alameda, CA**, where CHRS / BARM / SOWP will tell the stories of radio for generations to come.

Please enjoy this Journal. I always encourage you to contact me directly with your questions, ideas and comments. I am available at [kushseal@flash.net](mailto:kushseal@flash.net) or (415) 203-2747.

Best Regards, *Steve*

◇

## CHRS Sacramento Chapter News — by Dale Tucker

The Sacramento Chapter of CHRS held our annual swap meet March 1<sup>st</sup> in Citrus Heights at the Sylvan Oaks Library. We had strong attendance for an event that some thought would be rained out. Approximately 25 local radio enthusiasts spent the morning viewing the offerings. Everything from large consoles to current state of the art units. Some restored portables, others larger items such as an H.H. Scott receiver completely cleaned up and featuring new tubes, caps, etc. Fortunately it didn't rain during the entire event; had it rained we had the use of the Library's community room. All of the sellers and buyers seemed pleased, some made new friends. We had attendees from the Bay Area which was gratifying.

The Sacramento Chapter of CHRS is the successor to the Sacramento Antique Radio Club which was founded approximately 25 years ago. The Chapter currently has about 25 members who reside throughout the Sacramento region. Bob Moore, hosts a monthly member's meeting in Shingle Springs that is open to the interested public who may wish to find assistance in repairing/restoring their sets. Come join us – fans of classic radios are always welcome! ◇

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## CHRS Central Valley Chapter News — by Scott Scheidt, photos by Mick Daniels

**Christmas Luncheon and Radio Contest Awards:** The annual CVC Christmas luncheon was hosted at the Modesto Commemorative Air Force Hangar, a museum of vintage aircraft. The 2013 CVC Radio Contest awards were presented for the best restoration; Mike Biddison won 1st place, Bill Warner 2nd place, and Mick Daniels 3rd place.



Shirley Vikjord holding the Vikjord award. This award was created in memory of her husband, Ron Vikjord and is given each year to the 1st Place winner of the CVC Radio Contest.

### CVC Radio Restoration Contest



CVC Vice President John Wallin presenting awards to Mike Biddison, Bill Warner, and Mick Daniels (left to right).



1st Place: Mike Biddison's Stewart Warner 1252.



2nd Place: Bill Warner's Radio Keg.



3rd Place: Mick Daniels' RCA 61-10.

**Model-A Swap Meet:** For the last several years each January, CVC has operated a booth at the Turlock Model-A Swap Meet to expose the club to the public, promote CHRS membership, develop public interest in the vintage radio, and help with questions and requests for radio repair. Many members radios were on display with some offered for sale. The display once again included John Wallin's extensive display of restored vintage tube car radios. CVC had a successful event; there was much public interest and several were interested in club membership.

**Classes:** The weekly radio theory and radio repair classes plus the monthly cabinet restoration class continue. ◇

# The 2013 Bay Area Radio Hall of Fame Inductees

by Ben Fong-Torres — from his “Radio Waves” column in the SF Chronicle



Continuing from the front cover, here are brief biographies of the inductees:

**Henry Leff** — Honored for his role in education, the Brooklyn-born Leff developed the broadcasting department at San Francisco City College in 1948 and headed it for 35 years. He nurtured the careers of, among others, Carter B. Smith, Cheryl Jennings and Stan Burford, as well as Leigh Ann Meriwether and Barbara Eden. Leff, who died in 2007 at 88, was also an actor on radio (including the locally-produced “Candy Matson” and “Pat Novak” dramas), TV and in films. He was a founding officer of KQED.

**Jane Morrison** — Honored for her 30-year tenure as community affairs director at KNBR, beginning in the early ‘60s, she also was a groundbreaker as a teenage journalist in Oklahoma, later working for the Associated Press in Kansas City. The widow of Jack Morrison, who served two terms on the San Francisco Board of Supervisors, Morrison is described as the “grand dame of San Francisco politics,” according to Sen. Barbara Boxer.

**Dennis Netto a.k.a. Dennis Erectus** — An inventive and groundbreaking DJ on South Bay rock radio, most notably on KOME-FM in San Jose in the ‘70s and ‘80s. He was considered a pioneer “shock jock,” but, said longtime friend and colleague Jona Denz-Hamilton, “In real life he was a shy, intelligent guy” who declined offers from larger markets “to stay in the Bay Area with the people he cared about.” He died in June 2012 at age 63.

**Bobby Ocean** — Best remembered as a DJ on Top 40 powerhouse KFRC in the ‘70s, he also has been heard on hundreds of stations nationwide through his “voice imaging” business. Born Ray Lenhart, he began at KMBY in Monterey and Pittsburg/Concord’s KKIS (as “Radio Ray Farrell”) before moving to Fresno’s KYNO as “Johnny Scott.” Re-branded as Bobby Ocean, he graduated to status as a premier “boss jock” in San Diego, Los Angeles and San Francisco. Resisting offers from Chicago and New York, the Las Vegas native chose to stay in the Bay Area and worked at other local stations, including KIOI and KOIT.

**Mike Pechner** — The “weatherman’s weatherman” enters the Hall of Fame in the specialty category. He started at KCBS in 1968 as a desk assistant and became a weather reporter in 1977. He became interested in meteorology, he said, after witnessing a snowstorm in Novato in 1957. He remained on air until 2009 and continues to blog and do special projects for KCBS. Pechner holds a bachelor’s degree in environmental studies and geography from San Francisco State University, and is a noted forensic meteorologist and railroad enthusiast.

**Dan Rusanowsky** — The San Jose Sharks’ lead play-by-play announcer on radio and one of the organization’s first employees since the team first hit the ice in 1991. Heard on KUFX (“K-Fox”) and the Sharks Radio Network, Rusanowsky, who also serves as a producer of all Sharks broadcasts, is a 33-year veteran of hockey broadcasting. A native of Milford, Conn., he has served as a guest host on KNBR, as well as the nationally syndicated “Sports Byline USA” and “Sports Overnight America” programs.

**Mike Sugerman** — Well-known for his weekly “About The Bay” feature reports, Sugerman splits his work between radio (KCBS) and TV (KPIX). Sugerman has won multiple Emmy and Edward R. Murrow awards. At KCSB-FM at UC Santa Barbara, he anchored the news and had a DJ show. (His air name: “The Golden Beaver.”) He has a master’s in political science from San Jose State and was part of the stellar KFRC news team during the station’s “Big 610” heyday.

**Barbara Taylor** — KCBS’ longtime City Hall bureau chief, she joined KCBS in 1975, working on the editors’ desk until she got promoted to a job as a reporter. Specializing in politics, Taylor has covered six national presidential conventions and was part of the KCBS team that won the Edward R. Murrow Award in 2012 as the “Top News Radio Station.”

**Roy Trumbull** — Beginning in 1962, Trumbull was variously an announcer and what he calls a “techie.” A Marin County native, Roy worked at KDFC, KMPX, KBRG, KAFE, KPAT and KRE, where he was chief engineer. After a stint at a TV station, he worked at KNEW and KCBS. He later joined KRON-TV as assistant chief engineer for 22 years, and he is a respected voice artist, known widely as the “Story Spieler.”

**Bill Weaver** — The late Weaver was executive vice president of KLOK-AM (San Jose) and FM (San Francisco) and several sister stations in the mid-‘60s. He is credited with creating the Oldies format, all-requests radio and “Yes/No Radio,” which was essentially programmed by listeners’ votes. Weaver also tried simulcasting on two stations, in San Jose on KLOK and Orange County on KWIZ, with DJ Buddy Hatton.

**560/KSFO (Legendary Station)** — Born as KTAB in Oakland in 1925, KSFO reached its apex in the 1950s and 1960s as “The World’s Greatest Radio Station,” boasting Hall of Fame talent that included Don Sherwood, Jim Lange, Gene Nelson, Al “Jazzbeaux” Collins, Terry McGovern, Aaron Edwards and Carter B. Smith, as well as the fabled sportscasters Russ Hodges and Lon Simmons. Under the ownership of Gene Autry’s Golden West Broadcasting from 1956 until 1983, KSFO set the standard for “full service” in the industry, with unparalleled personalities, news coverage, sports play-by-play and community involvement. ◇

# Remembering KRE

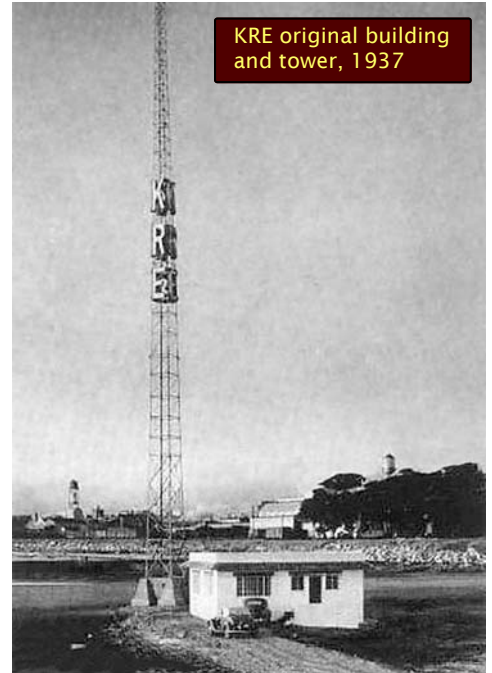
Photos by Mike Adams, article by Richard Watts

KRE has earned a significant place in Bay Area radio history. Since 1922 KRE has been broadcasting from Berkeley. It began operations from the Claremont Hotel in the Berkeley Hills under the ownership of the *Berkeley Daily Gazette*, and then the First Congregational Church that purchased KRE in 1927. In 1930, with a lease from the church, the Chapel of the Chimes and its president Arthur Westlund assumed operational responsibility. In 1933, the studios were moved to the Glenn-Connolly Building on Shattuck Avenue in Berkeley with transmission still from the Claremont Hotel.

In 1937 a small transmitter facility was constructed at 601 Ashby Avenue in Berkeley, KRE's current location. In 1938 a single-story addition of studios and offices were constructed with Art Deco styling. In the early 1950s, the second story was added providing more office and conference space. During this time KRE was notable in being one of the first Bay Area stations to get an FM license. KRE also was one of the first stations to broadcast in stereo.

In 1963 KRE was sold to Wright Broadcasting and the call letters were changed to KPAT. Since then the station has continued to operate under a succession of new owners with subsequent call letter changes. It became KBLX (August 1986-April 1989), KBFN (April 1989-August 1990), switching back to KBLX (August 1990-May 1994) and finally KVTO (May 1994-Present). For more information about the history of KRE please refer to the article *Voices Out of the Fog* by John Schneider at his website <http://www.olderadio.com/archives/stations/sf/kre.htm> and at <http://bayarearadio.org/schneider/kre.shtml>.

Since 2003 CHRS has been fortunate to be a part of KRE's destiny and convert KRE's unused studio, control rooms, and offices into a museum and center for radio education and history. Following are photographic moments from KRE's history and from our time at KRE . . .



KRE original building and tower, 1937



KRE aerial view, 1947



KRE two-story, 1950



KRE single-story, 1947





**Arthur Westlund**  
President, Chapel of the Chimes



**KRE Control Room circa 1938**



**Don Hambly**  
KRE General Mgr. 1930s—1960s



**Tom Nelson**  
CHRS member who broadcast from KRE on Dec 7, 1941



**"Campus News" broadcast, 1942**



**Radio play at KRE in the 1940s**



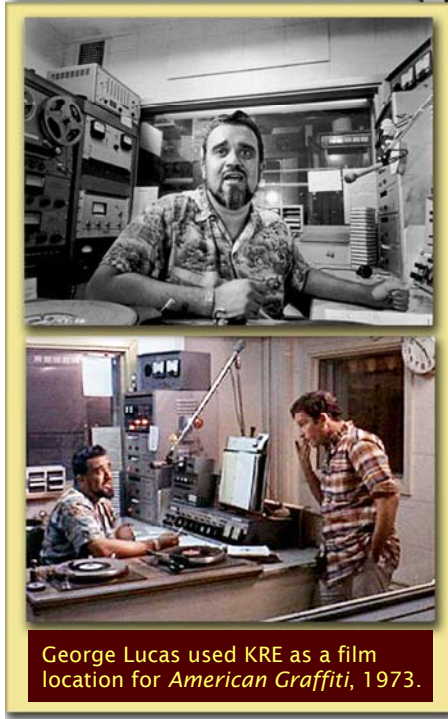
**Joe Staley at the controls, 1948**



**KRE staff in 1950s**



**At KRE in the 1970s**



**George Lucas used KRE as a film location for American Graffiti, 1973.**



**KRE in the 1970s**

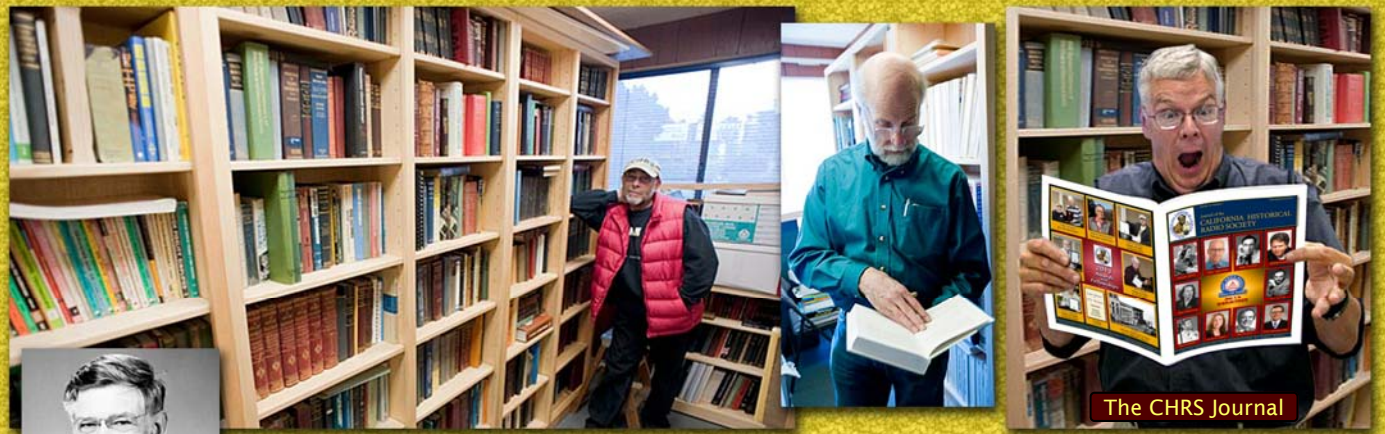
For several years, the classic art deco KRE studio and offices were vacant; KRE had fallen on hard times and had become quite an ugly eyesore. In 2003, CHRS was offered an opportunity to occupy KRE at no-cost by Inter-Cities Broadcasting Corp. as a center to support Bay Area radio history. CHRS volunteers were up to the task and devoted thousands of person-hours to bring the KRE facility back from the brink.





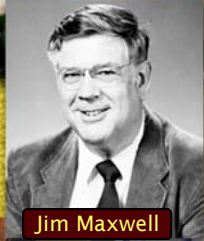
The CHRS museum spans many rooms on two floors and includes galleries of: radio by era, television, Hi-Fi, communications gear, test devices, and studio broadcast equipment. In addition is the restored KRE control room and control room for Electronic Transcription. Here are a few glimpses:





The CHRS Journal

The CHRS / W6CF amateur radio station at KRE was once the station of James Maxwell, the West Coast Director of the ARRL. In honor of his memory, Jim's station was bequeathed to us along with his extensive library of over 800 feet of books and documents occupying 4 rooms.



Jim Maxwell



CHRS is home of the Bay Area Radio Museum online, the Bay Area Radio Hall of Fame, and its gallery of annual honorees.

CHRS at KRE has become a gathering place and for vintage radio enthusiasts, the broadcast community, historians, and the public; and a center for radio history, education and preservation.



Museum visitors



KRE alumni signing the door



Interviews and Oral History



Restoration contest



Repair Clinics, classes, and assistance



Each year, several outdoor events have been hosted at KRE including swap meets and the annual KRE Live! Radio Day By the Bay. KRE Live! includes an auction, a 1940s radio play performed by the Broadcast Legends, a jazz band, food, and displays.





Taking it down for the last time.

Unfortunately, the new owner's plans for the facility no longer include CHRS and we've been asked to vacate by March 1st; so once again volunteers are packing up and moving. The new owner intends to use the facility to continue transmitting KVTO, the successor station to KRE; otherwise her plans for the building are not known to us. So ends another chapter for this wonderful facility and I truly hope KRE has a future worthy of its historic importance.

Our ten years at KRE has clearly shown the importance of having a museum and a center for radio education and history serving the public, the broadcast community, historians, and enthusiasts. Others believe this too as we have received considerable financial support to purchase a larger building in a great location. Now as we embark on our next chapter . . .



2152 Central Avenue in Alameda, CA.



# Radio Spies: Early Israeli Signals Intelligence Work

by Bart Lee, K6VK

The State of Israel fought to be born and then for its life in 1946 through 1948, first against the British then against Arab armies. Israeli Signals Intelligence (“SIGINT”) in Israel’s War of Independence in 1948 relied on World War II receivers for interception, [2] mostly if not all British. The Israelis sought to discern multiple enemies’ intentions and capabilities. As an Israeli General summarized the value of SIGINT: “...its ability to follow targets simultaneously in far-distant locations is what makes it possible to create a dynamic picture of adversaries.” [2]

The fact that Israel’s early enemies, *e.g.*, Egypt and Jordan, all spoke Arabic provided an opportunity for native Arabic-speaking Israelis to act as radio intercept operators, translators, and analysts, as they listened. Arab armies, *e.g.*, the British-trained (and led) Jordanian Arab Legion, tried to put an end to the new state of Israel. They also inherited British radio equipment, likely much the same as the Israelis used. In 1948, tactical intercepts, mostly Morse code traffic, played a role in Israel’s fight to survive the Arab invasions.

An Israeli radio intercept station in the 1948 war [2] is the first illustration, figure 1. The receiver is a British Wireless Set WS 62 radio [1], figure 2. It operated primarily from 1.6 to 4 MHz, with a secondary, less useful band of 4 to 10 MHz. Twelve volts powered it to a transmit radio-telephone range of 14 miles with a 12 foot whip antenna. The range was longer on receive especially on CW Morse code. It directly derived from the similar WS 22 and succeeded the WS 19 “tank” set (discussed below -- still popular with military radio collectors). The radioman on the left in figure 1 appears to be using a microphone which, if connected to the radio and transmitting, would be a risky practice at an intercept station disclosing its existence and location to the enemy. It may, however, just be an internal station intercom system or the station may have served a dual purpose.



Fig. 1: Operations in an Israeli SIGINT unit in 1948 [2].

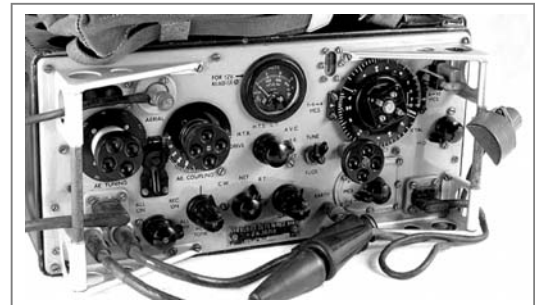


Fig. 2: WS 62, British successor to the WS 19 [1].



Fig. 3: Arab Legion tanks (APCs) in 1948, note the long whip antennas (LIFE magazine photo).



Fig. 4: CHRS member Bjorn Forsberg, SM5UR, working a WS 19 at a recent military radio collectors’ meet. [www.antiqueradio.com/brown\\_milrad\\_03-99.html](http://www.antiqueradio.com/brown_milrad_03-99.html)



Fig. 5: A Haganah intercept station with its CR1000,



Fig. 6: The British high-end CR1000 receiver [3].

Arab Legion tanks in 1948 communicated via long whip antennas and in all likelihood on British WS 19 radios which used such whips. See figures 3 and 4, Arab APCs of 1948 and a WS 19 tank radio in recent operation.

Another early Israeli intelligence operation, paramilitary and perhaps earlier than 1948 (the “Haganah” organization), put together a more sophisticated and perhaps less tactical intercept station, figure 5. [2] The radioman in the center appears to be copying signals while the radioman in the foreground appears to be operating a Morse telegraph key on an internal “order line,” perhaps reporting the intercept. British Reception Set CR1000 provided the intercept station a high-grade multi-band receiver employed in fixed services [3], figure 6. The CR1000 made available a wide frequency range to intercept operations, 60 KHz to 30 MHz. It allowed intercepts of both CW Morse and radio-telephone modes. Dual power systems permitted it to operate from AC mains (240 volt) or six volts DC [3]. Before and during the War of Independence, listening to British communications could supply valuable insight into British intentions in Palestine which were often hostile. See Figure 7, British troops and their radio in Haifa in 1948.

An Israeli mobile intercept operation in the 1948 war [2], modestly camouflaged, is shown in figure 8. It would appear to be located at a desert front in the war, perhaps in the South.

In the 1956 “Sinai War,” the Egyptian destroyer *Ibrahim Al-Awal* set out to bombard Haifa. Naval Intelligence in Haifa knew it was coming by intercepts of traffic between the Egyptian fleet headquarters and the destroyer. [2] The Israeli Navy deployed, battled the ship, and captured it -- converting it to Israeli Navy use.

Around 1960, the Israelis had intercepted and deciphered radio traffic between Cairo and Damascus (the capitals of the short-lived United Arab Republic, the “UAR”). These interceptions supplied actionable intelligence about Egyptian intentions and action in the Sinai Peninsula. But UAR, likely with Soviet help, also employed its own SIGINT, by which



Fig. 7: British troops in Haifa, now in Israel, in May of 1948; note the whip antenna. (LIFE magazine photo).



Fig. 8: An Israeli mobile monitoring station at a front in 1948; note the antenna mast at the front of the truck [2].

it captured an Israeli Secret Intelligence Service (*Mossad*) spy high up in the Syrian ruling circles, Eli Cohen. “Early in 1965 as he was sending a transmission, he was captured by the Syrian security forces” [2] and publicly hanged. He operated his radio from his apartment in Damascus.<sup>1</sup>

Later, on the second day of the Six Day War of 1967, Israeli intercepts of communications between Egypt (Col. Nasser) and Jordan (King Hussein) played a decisive role [2]. The disclosure of this traffic for political reasons resulted in monitored circuits closing down, and the consequent loss of valuable enemy traffic for analysis.

Israel’s SIGINT operation is or was known as Unit 8200. It was formerly denominated Unit 515. For all its modest nomenclature, today Unit 8200 is the largest element of the Israeli defense establishment. Its primary base is located in the Negev, but it also uses listening sites elsewhere in Israel and outside Israel. Unit 8200 is comparable to the British GCHQ (General Communications Head Quarters), and likely in some ways superior. The U.S. National Security Agency (NSA) and Unit 8200 share information.<sup>2</sup>

Recently it seems that the Israeli intelligence community is on something of a charm offensive, with, for example, the 2012 publication of ISRAEL’S SILENT DEFENDER [2], from which most of the detail in this note derives. This book is quite candid about both successes and failures, and excellent on SIGINT.<sup>3</sup>

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#### Notes:

- <sup>1</sup> At one point Cohen had advised the Syrians that their troops suffered in hot bunkers, so it would be good to plant shade trees for them over each bunker. So that’s what the Syrians did, with fast-growing eucalyptus trees. Then in the 1967 war, Israeli artillery had ready-marked targets, even better than radio direction finding fixes. (This according to a reliable source in Israel.)
- <sup>2</sup> The sharing is done pursuant to a Top Secret formal written understanding disclosed by Edward Snowden, in which Unit 8200 is known as “Israel SIGINT National Unit,” ISNU: see [www.theguardian.com/world/interactive/2013/sep/11/nsa-israel-intelligence-memorandum-understanding-document](http://www.theguardian.com/world/interactive/2013/sep/11/nsa-israel-intelligence-memorandum-understanding-document) [.]
- <sup>3</sup> The book nonetheless fails to mention either the Israeli attack on the *USS Liberty* on June 8, 1967, or acknowledged Israeli spy Jonathan Pollard sentenced to life in prison in 1987 for espionage against the United States.

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#### Sources:

- [1] Davies, Anthony C., *WW2 British Army Battlefield Wireless Communications Equipment*, see [www.async.org.uk/Tony.Davies/pubs/HISTELCON-ACDavies.pdf](http://www.async.org.uk/Tony.Davies/pubs/HISTELCON-ACDavies.pdf) [.] Davies’s picture of WS 62 is figure 2 herein.
- [2] Gilboa, Amos, and Lapid, Ephraim, eds., *ISRAEL’S SILENT DEFENDER* (The Israel Intelligence Heritage and Commemoration Center - Jerusalem, 2012); this is a collection of essays by principals in Israeli intelligence operations and agencies.
  - Figure 1, 1948 intercept station with WS 62 radio, first plate after 105
  - Figure 5, intercept station with CR1000 radio, fourth plate after 105.
  - Figure 8, mobile intercept station, sixth plate after 105.
  - Nasser and Hussein traffic intercepted, 67, 198
  - Navy use of intercepts to capture Egyptian destroyer, 268
  - SIGINT capability, 197
  - Spy Eli Cohen, 192
  - World War Two radios, 191
- [3] Meulstee, Louis, *Wireless for the Warrior*, see [www.wftw.nl/rscts.html](http://www.wftw.nl/rscts.html) [.] Meulstee’s picture of the CR1000 radio is figure 6 herein.

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*73 de Bart Lee, K6VK (Fellow of the California Historical Radio Society, holding both FCC General [Commercial] with Radar and Amateur Extra licenses). Copyright Bart Lee, 2014.*

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# Rejuvenating Thoriated-Tungsten Tubes

by Norm Leal

There are three major categories of tube cathodes/filaments used in radio:

The first is Tungsten that is the hottest operating at 2500K. It is also the brightest, almost like a light. As long as a tungsten filament isn't open or the tube isn't gassy most will operate. Emission in these tubes is greatly determined by filament voltage and heat.

The second type of filament is Thoriated-Tungsten operating at 2000K. These use around 3% thorium alloyed with tungsten and have good emission with less heat. Filaments are still bright but nothing like pure tungsten.

The third type is the oxide coated cathode operating at 1100K. These emit electrons at much lower temperature and are the way most later receiving tubes were made.

Tubes such as UV200 and UV201 have tungsten filaments. These draw more current than later types, 1 amp vs. 0.25 amps for the "A" version. If the filament lights, the tube should be usable. I have found UV200's with good filaments in dud piles. Although good some cannot be tested on a Hickok 539 series tester. Hickok testers are looking for trans-conductance but plate voltage is above the point of ionization. The tube will not operate in a Hickok tester but works as detector on voltage of 22.5 volts or less. Most tubes I've come across like this had a red tint to the glass.

Tubes such as UX200A and UX201A have Thoriated-Tungsten filaments. Over time Thorium can be burned away from surface of the filament. This will cause emission to drop. Some tubes won't show emission unless the filament voltage is increased. Emission in Thoriated-Tungsten tubes can usually be brought back. Increasing the filament voltage drives more Thorium to the Tungsten surface. Tube manufacturers such as Western Electric had a burn-in process operating the filament for 2 to 24 hours at elevated temperature.

Rejuvenation can be accomplished by operating the filament of a Thoriated-Tungsten tube in a tester at increased voltage for a period of time. UX201A (01A) is rated a 5 volts on the filament. To rejuvenate increase it to 6.3 volts and let the tube remain lit without plate voltage, that is, not under test. Retest the 01A with 5 volts on the filament and burn in again until no improvement is noted. Some improvement may occur in minutes, but others may take an hour for acceptable emission. Almost all RCA and Cunningham tubes can be brought to acceptable emission.

There are many other Thoriated-Tungsten filament tubes that can be rejuvenated. Most older battery radio tubes were made this way.

Some later 01A's use oxide coated filaments and are marked 01AA but not all. Some will still be marked 01A. These are dim at 5 volts on the filament and cannot be rejuvenated like Thoriated-Tungsten filaments.

Oxide coated filaments with low emission may be due to contamination. In some cases the contamination may be cleaned up by forcing a tube to draw more current. This works well on tubes like 26 but may not be worth it on newer types. If filament voltage is increased by 2 volts and grid #1 is made positive, a tube will draw more current. A 26 tube will show a green glow between elements if made to dissipate higher power. It only takes a few seconds to clean up oxide coated filaments. You will need to experiment on this.

Some gassy tubes can be saved. I've been able to remove gas from several UX280's. Wrap a tube in paper towel and put it in a microwave oven. Operate the oven for a second. The getter material on the glass will flash. Do not let it continue as the glass will get hot and crack. Flashing the getter material this way may remove the gas. Again a person has to experiment but saving one UX280 is worth the effort.

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# Replacing Transformers Having 2.5 Volt Windings

by Norm Leal

You have several options in the event your radio has a faulty power transformer with a 2.5 volt winding:

First, it might be possible to find a satisfactory replacement. Vendors who may be able to help are Play Things of the Past at [www.olderadioparts.com](http://www.olderadioparts.com), Antique Electronics Supply at [www.tubesamdmore.com](http://www.tubesamdmore.com), or Radio Daze at [www.radiodaze.com](http://www.radiodaze.com). They offer replacement transformers with 2.5 volt filament windings. If you are lucky it will fit on the chassis and operate the radio.

A second option is to send out the original transformer to be rewound. The cost of having one rewound is usually \$100 or more.

Another option, a transformer with 6.3 volt center-tapped filament winding will supply 3.15 volts to each side of center tap. A radio could have filaments rewired to use center tap and one side for half the tubes and use the other side and center tap for the rest. Resistance should be added in series with each half winding to drop 0.65 volts. This resistance can be in the form of a fraction ohm resistor or some copper wire wound in a small coil.

Or you might consider modifying a transformer with a 6.3 volt winding. Transformer voltages are determined by turns ratio. Most of the ones I've tested were 4 turns per volt or around 500 turns on the primary, (for 125 volts in U.S.). You don't need to know the number of turns on the primary to add a winding. Power transformers usually have 6.3 volt filament windings as the outside layers. This winding can be removed and a 2.5 volt one added. If the transformer is wound 4 turns per volt only 10 turns of wire are needed. You can check voltage by winding and measuring 1 turn of wire. If a transformer is 4 turns per volt, a single turn should read around 0.25 volt AC. Voltage will be a little high without a load. Use 16 or 18 gauge wire for the 2.5 volt winding. Heavier wire will give better regulation but not more available current. Current is limited by the transformer core and the primary winding wire size. If the original 6.3 volt winding could supply 4 amps ( $6.3 \times 4 = 25$  watts), the 2.5 volt winding can supply 10 amps ( $2.5 \times 10 = 25$  watts).

Still another way, use a transformer with 6.3 volt filament winding and replace the 2.5 volt tubes (valves) with 6.3 volt equivalents. Fortunately, most 2.5 volt tubes have 6.3 volt equivalents. The following are possible tube substitutions:

Tubes to replace having 2.5 volt filaments	6.3 volt equivalent with same basing
2A3	6A3
2A5	42, 41
2A6	75
2A7	6A7
2B7	6B7
2E5	6E5
24A	36
27	37, 76

Tubes to replace having 2.5 volt filaments	6.3 volt equivalent with same basing
35/51	39/44
45	71A*, 6A3
47	6A4*
53	6A6
55	85
55	76, 37
57	6C6, 77
58	6D6, 78

\* Be sure voltages are within rating of the tube.

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# Replacing Eyelet Riveted Dial Covers

by Mark Palmquist



*Recently I had need to replace a dial cover in a bezel where the dial cover was riveted in place using small eyelets. I purchased a dial cover from Mark Palmquist along with a setting tool and some instructions. In my first attempt I used a plain steel rod to back the setting of the eyelet which repeatedly slipped and gouged the dial cover. It turns out tools and technique are everything to success. When I ordered a replacement dial cover, he provided additional help plus an eyelet backing tool designed not to slip which made all the difference. I asked him if he would be willing to provide an article and he consented. I hope you find it as useful as I did.*

*- The Editor*

To set eyelets successfully, it is important to have the right tools. Following are the tools I use and recommend. These tools are available from a variety of sources; alternative tools available to you that serve the same function can certainly be used. It is critical to have a setting tool that is small enough for the 1/16th or 3/32nd inch eyelets used to rivet the dial cover to the bezel. Since tools can be hard to locate for eyelets this small, I offer a USA-made setting tool and brass pin.

## Eyelet Installation Tools



Artist cutting mat mounted on steel plate



Small hammer examples

- Safety Glasses:** Wear safety glasses with side shields when you have any tool in your hand for any reason.
- Artist Mat:** Self-healing mat designed for artist cutting is used for punching holes for the eyelets in the dial cover. I taped my mat on a piece of steel for added support and firmness; this is optional. Available at hobby craft stores.
- Punch:** A 1/16th inch hollow punch often used for leather is used to make holes in the dial cover. Available at hobby craft stores.
- Aligning tool:** This can be an awl or pick sharp enough to allow the eyelet to slip over just the point; this is used to insert the eyelet.
- Setting tool:** Eyelet setting tool for 1/16th and 3/32nd inch eyelets. Available on Ebay or from the author.
- Vise:** A sturdy bench-mounted vise is needed to hold the anvil or brass pin securely, the heavier the better.
- Anvil:** A bar mounted in the vise with a hole to insert and hold the Brass Pin upright. This is optional. It positions the bezel assembly away from the vise so it won't mar or scrape. My anvil is homemade from 1/4" steel key stock.
- Brass Pin:** This pin is used to support the back side of the eyelet when the eyelet is set. In the photo above center, the pin is mounted in the anvil — see also the photo to the right for a different view. Notice the dimple on the end of the pin, this aligns inside the eyelet so the whole bezel assembly doesn't slip or move when the eyelet is struck with the setting tool. Available from the author.
- Hammer:** A small 12 ounce hammer for setting the eyelets. The hammers I like to use are shown above right.

My hammers: On the left is a Warrington hammer by Sheffield I use with the punch to make holes; I wrapped it with 3M fiberglass tape to lessen the risk of marring the dial cover. On the right is a hand-forged Japanese octagonal hammer that I use when setting the eyelets.



These are the editor's similar tools. The setting tool and brass pin were acquired from the author.

I recommend first cleaning the work area and floor so a dropped eyelet can be found. Please wear safety glasses throughout this process. I also wear exam gloves to maintain cleanliness. *[Editor's note: In the photos, the blue plastic static wrap is used by the author to protect the dial cover in shipping; as an added precaution I left it on the face and interior of the dial cover during assembly to maintain cleanliness.]*

To begin, first remove the old dial cover and the old eyelets. I remove the eyelets by shearing them off with a flush-cutting diagonal pliers. You can also crush the eyelet with needle-nose pliers but this can scratch the bezel. I **never** drill out the old eyelets. This can quickly mess up the holes in the bezel and you risk damage and injury. Power tools, dial covers, and bezels do not mix.

Next, whether you purchase a dial cover or make your own, test fit the dial cover in the bezel. With the dial cover seated in the bezel, make a mark using a fine tip felt pen on the dial cover through each eyelet hole in the bezel. These marks will indicate where to punch holes in the dial cover. I also add an inconspicuous mark in the same place on both the dial cover and bezel to insure that the dial cover is oriented the same way when reassembling and mounting.

To make the holes, place the edge of the dial cover on the artist's mat; position the tip of the punch over a mark and punch a hole into the dial cover by tapping the punch with a small hammer. I place a white non-woven cloth on the mat under the dial cover to aid in seeing the marks when positioning the punch (see the photo of my mat in the tools section); the cloth is optional. The punch can fill up and clog with plastic after a couple of holes; it is important to keep the punch clear so it will make cleaner holes. To do this, I have a 3/8" long 1/16" diameter drill rod mounted in a metal block that I can use to push out the plastic; I put the punch over the drill rod and tap it a couple of times with the hammer.

Next mount the brass pin *securely* at edge of vise (or in the anvil if you are using one). See figure 1. If using an anvil, I put blue masking tape on it to protect the bezel from scratches.

To install each eyelet:

Place an eyelet on the brass pin (figure 2). You can put some double-sided tape on the end of the brass pin to keep the eyelet in place. Then place the dial cover and bezel assembly over the eyelet aligning the hole to the eyelet. Use the aligning tool from the top side to align the holes and to thread the eyelet through the hole. *[Editor's note: Due to the tight fit of the eyelets in the holes, I had difficulty inserting the eyelets this way. As an alternative, I placed an eyelet on the aligning tool and inserted the eyelet through the dial and bezel before placing it on the brass pin (figure 3). A piece of blue masking tape can be used to hold the eyelet in place if needed].*

With the eyelet firmly seated on the brass pin, position the setting tool on the top side of the eyelet as shown in figure 4. Then set the eyelet by striking the setting tool lightly 5 times with a small 12 oz. hammer. This flares the eyelet so it looks the same on both sides.

Repeat for each eyelet until all the eyelets are installed.

The techniques described in this article can be used for a variety of applications in radio restoration where eyelets are used, like dial indicators, etc.



Fig. 1: Brass pin mounted in vise.

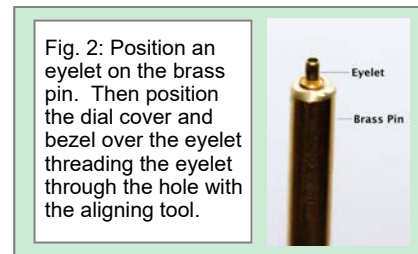


Fig. 2: Position an eyelet on the brass pin. Then position the dial cover and bezel over the eyelet threading the eyelet through the hole with the aligning tool.

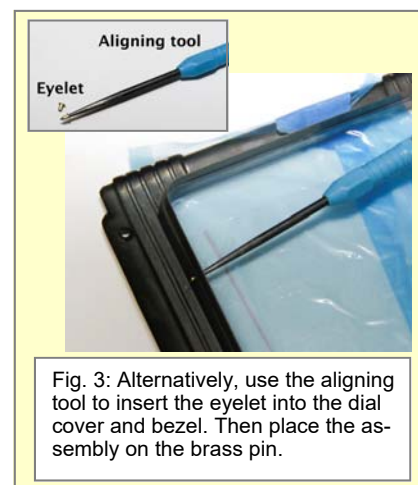


Fig. 3: Alternatively, use the aligning tool to insert the eyelet into the dial cover and bezel. Then place the assembly on the brass pin.

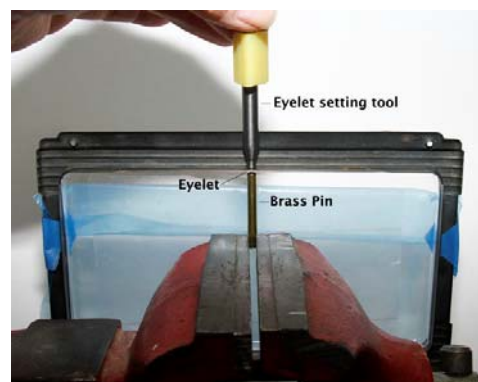


Fig. 4: Position the setting tool on the eyelet then set the eyelet by tapping with the small hammer.

## Shellac — A Traditional Finish Yields Superb Results \*

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© by Jeff Jewitt

*This is the next in a series on restoration of vintage wooden radio cabinets. This article is recommended by Jim Bradt as it describes the techniques he employs in the restoration of radio cabinets at the CHRS Museum.*

*Shellac was the predominate finish of radio cabinets in the 1920s before manufacturers widely adopted nitrocellulose lacquer. Shellac is closely related to nitrocellulose lacquer in its origins and characteristics. It can be used as an alternative to lacquer or interchangeably with lacquer. The padding techniques described in this article offer several advantages including providing outstanding results that reduce the need for rubbing out the finish.*

— The Editor

**This article has been omitted as the author requested this article only appear in the original printed form of the journal.**

**Similar information can be found at the author's website at [www.homesteadfinishingproducts.com](http://www.homesteadfinishingproducts.com)**

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# The 2013 CHRS Restoration Contest Results

by John Staples


This contest is coordinated with the Québec Société Québécoise des Collectionneurs de Radios Anciens (SQCRA) radio contest; the winner of this contest will be submitted as an entry to the SQCRA world-wide contest. The CHRS contest ended in December with awards presented at the General Membership meeting. The entries were judged twice: first at the beginning where poorer condition receives a higher score; and second on the quality of restoration of the finished radio. All of the radios were very well done and selecting a winner was not easy. The results are:


 **Contest Winner** — **Cliff Farwell - Fairbanks Morse 5C**


  **Initial state:** Rusty chassis and power transformer, speaker cone almost entirely missing, grill cloth torn, veneer damage.





Runners-up listed in alphabetical order showing the finished radio along with a description and image of the initial state:


 **Seth Arp - Philco 50**  
**Initial state:** Very rusted chassis, veneer missing and coming off cabinet, knobs missing.





 **Lew Doty - Ultradyne**  
**Initial state:** Cabinet has some veneer cracking off cabinet, chassis in fair condition and free of rust. Knobs present.



 **Anthony Golden - Zenith 5R216**  
**Initial state:** Cabinet in very poor condition and in pieces, rust on chassis and power transformer. A real basket case.



 **Hil Hampton - Philco 59**  
**Initial state:** Cabinet in very poor condition, extensive damage to photo finish, dirty chassis, rotten line cord.



**Greg Farrell - RCA H-Set Transmitter 20 kW Independent Sideband Transmitter installed and operating at the KPH transmitter site at Bolinas, CA.**

**Initial state:** The transmitter had accumulated corrosion from years of exposure to the moist and salt-laden air in the Bolinas headlands affecting every part, bolt and pore. Many components had been eaten away, such as the sockets for the high-power amplifier tubes, wiring had become brittle, gears frozen, motors nonoperational. **Result:** The set was disassembled, new mechanical components constructed, wiring replaced. The team invested hundreds of hours in the restoration producing results that are most impressive.



'Before' condition: Unrestored interior of a transmitter in similar condition.

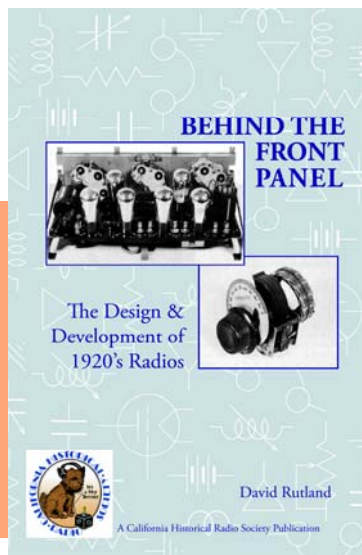


'After' condition: Restored interior of the RCA transmitter.



Front view of the restored RCA transmitter. ◇

**CHRS Books Available Now**

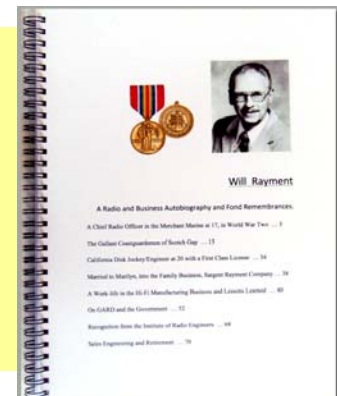


**Behind the Front Panel: The Design and Development of 1920's Radio** by David Rutland has been re-mastered by Richard Watts for CHRS. With emphasis on radio technology, Rutland describes the development of 1920s tubes and radio circuitry designs by De Forest, Marconi, and other inventors and manufacturers. A classic!

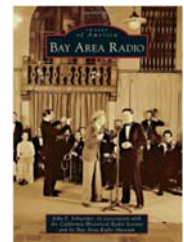
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**Will Rayment** with Bart Lee has authored an autobiography of his life from WWII Chief Radio Operator in the Merchant Marine through Sargent Rayment Company and the California Radio and HiFi Industry through the 20th Century. Highly informative piece of San Francisco Bay Area history.

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*Tom Nelson*  
*&*  
*Eric Wenaas*

*Awarded*  
*Fellows*  
*of CHRS*  
*in History*

*No Photos*  
*Available*



*KSFO*  
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