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JOURNAL OF THE
**CALIFORNIA
HISTORICAL
RADIO SOCIETY**

FOR THE RESTORATION AND PRESERVATION OF EARLY RADIO



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! HELP WANTED !!!

MEETINGS and SWAP MEETS: CHRS meetings are held 2-3 times per year. Locations are announced in CHRS publications and by mail. Swap meets are in February, May, August and November at Ampex Corporation in Redwood City, PLEASE DO NOT ENTER BEFORE 8:00 AM. Regional meets at various Northern California locations are conducted from time to time. Contact the Publicity Officers if you want to sponsor a swap meet in your area. Local swap meets bring out new old radios!

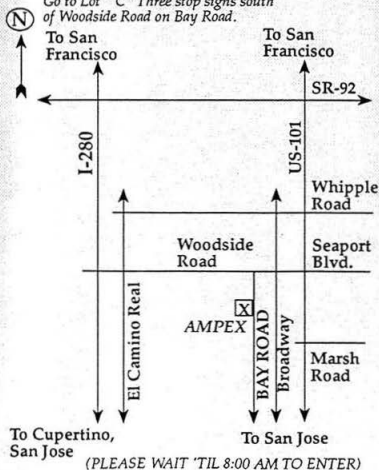


ABOUT CHRS

The California Historical Radio Society is a non-profit 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 provide the opportunity to exchange ideas and information on the history of radio, particularly in the West, with emphasis in collecting, literature, programs, and the restoration and display of early equipment. The *Journal* of the Society is published periodically in printed and occasionally in audio tape format, and is furnished free of charge to members. Yearly membership dues are \$15.00 (US funds, please). Submissions for the *Journal* are always welcome. Typewritten copy is preferred, submitted on 3.5 inch IBM or Macintosh diskettes in ASCII or Microsoft Word. Send all material to editor Bart Lee and include your name, address and phone number. You write about radio, and we'll print it. The *Journal* is copyright © 1995 by the California Historical Radio Society, all rights reserved. No part of this publication may be reproduced in any form, or by any means, without prior written permission from CHRS, except that you may make "fair use" of quotations of text fully attributed by you to source (this *Journal*) and author. —CHRS, P.O. Box 31659, San Francisco, CA 94131; Phone (415) 978-9100.

Map to AMPEX Corp. Swap Meet

Go to Lot "C" Three stop signs south
of Woodside Road on Bay Road.



THE PRESIDENT'S MESSAGE

by Dale Sanford
107 St. Thomas Way
Tiburon, CA 94920



1995 has been a great year for the California Historical Radio Society. We've had great swap meets... increased membership... an outstanding first Journal compiling 20 years of Hints and Kinks... a nice historical tape... the badge problem solved (almost) and a good time was had by all. Since the November 4th meet at Ampex is the last of the year, we need to look forward to 1996. I need to hear from members who are willing to serve on next year's Board of Directors. We need all the help we can get, so if you can help, please respond on the enclosed form. You will note that the form is also the annual call for dues. For those who have paid in advance, we thank you. If you are in doubt about your membership standing, check the expiration date on the address label.

For members that can offer services to other members for a fee, such as speaker repair, transformer winding, dial glass, cabinet refinishing, knob reproduction, and the like, we will offer free advertisement in the Journal and the membership directory. We would like to update your radio interests, so please pick your favorite four on the enclosed form. Please send it in whether or not you are renewing this year. Thanks, for now -- Dale Sanford.



REPORT ON THE JUNE 1995 CHRS MEETING OF THE BOARD OF DIRECTORS



by Russ Turner
Secretary, CHRS

The Board of Directors of the California Historical Radio Society convened after the San Francisco Swapmeet, waiving all formalities. After discussion, a motion was made seconded and passed to amend the By-Laws: the officers will be appointed by the Board, the president-elect will serve as vice president until the then president steps down, and the past president will be available as needed. Bart Lee, as counsel, was directed to implement the paperwork.

Bart still needs to get the CHRS library out of his basement, with overloaded shelves and access required. Loan to the Club of a small truck or van would be appreciated. CHRS has already stored a lot of library material with Perham Foundation, which is moving it storage again, to across the street from the Kelly Park, San Jose new Museum site. The Perham Foundation also needs volunteer help. The Presidio may open up as a possible museum site because the Letterman Hospital area is becoming a Science and Technology center.

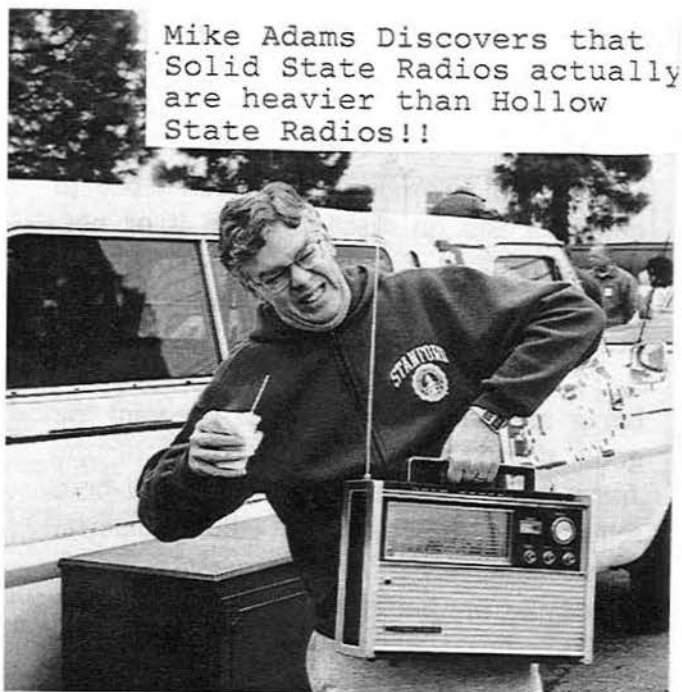
The *Journal* will be soon close to complete and on disc* [believe it or not, you're reading it right now! -- ed.]. The new plan is to edit the material and then provide it to a new publisher.

There is a good amount of material being sent in by members -- keep up the good work! Regularity in issues of the *Journal* will be a priority. There will be a sequence of steps, with Bart editing material then sending it on. Announcements can go directly to the publisher for insertion, who will coordinate graphics with the material.

Tapes were discussed with the consensus being to discontinue them for now. It was moved,, seconded and passed to issue written Journals quarterly.

The present Club computer is too complicated and difficult for use by low tech members. Maybe we could find a tube-type model which would be more suitable.

Membership is increasing but mostly with locals. Keep handing out the membership applications, and include a Journal so people can see what they get. The membership list should be free to members and old members should be listed as well so people can stay in contact. On Publicity, we need a permanent advertisement in Antique Radio Classified. A quarter page would suffice. ARC is good as it ties people around the country into the now 200 or so clubs and events taking place every year. Badges were discussed with a new supplier coming on line. The Hot Line and Post Box will be checked weekly and forwarded to Dale. Paul Bourbin and Russ Turner agreed to do so. Our friendly, congenial working lunch adjourned at about 1PM. You too can have a free lunch from time to time: Run for a seat on the Board in the next election!



THOUGHTS OF CHAIRMAN BART

by Bart Lee, xWPE2DLT
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We have **great news** for the vintage radio hobby on the West Coast. The Antique Wireless Association in New York has bestowed its highest awards upon us this year. The **Houck Award** is given for outstanding work in radio history documentation and preservation. (Harry Houck was Major E.H. Armstrong's chief engineer, and very active in the early days of the A.W.A.). The Association presented the Houck Award for Documentation to our **Mike Adams**, for his video work on *The Doc Herrold Story*, *Broadcasting's Forgotten Father*, and on *The Radio Collector*. Both are regularly featured on PBS TV stations. The **Perham Foundation** received the Houck Award for Preservation, for its successful fight to preserve the integrity of the DeForest Archives and the Electronic Museum's collection of artifacts with its lawsuit that resulted in the \$775,000 judgment, and its work to re-institute the Electronics Museum for the benefit of the public. The process of re-siting the museum is continuing in San Jose, with a letter of intent to site the new museum in the Kelly Park Historical Museum (see nearby architects rendering of the proposed buildings). Next come contract negotiations. Mike Adams accepted his award personally, and Mike and **George Durfey** and I accepted the Preservation award for the Perham Foundation. A nearby photo shows **Ray Hutt** of the Smithsonian Institution presenting the award to George Durfey and Mike Adams. (I also had the privilege of presenting my research on Early Wireless on the West Coast to the A.W.A. convention).

Photos, top to bottom; top: Ray Hutt of the Smithsonian Institution, on behalf of the Antique Wireless Association, presents the Houck Award for Preservation to the Perham Foundation, received by Directors George Durfey and Mike Adams. Center: An architect's rendering of the proposed Electronics Museum of the Perham Foundation, as it will be sited in the San Jose Historical Museum at Kelly Park. Bottom: Bart Lee at A.W.A. collects paper at the swap meet (all the other stuff being too heavy to ship!)

Photo by George Durfey

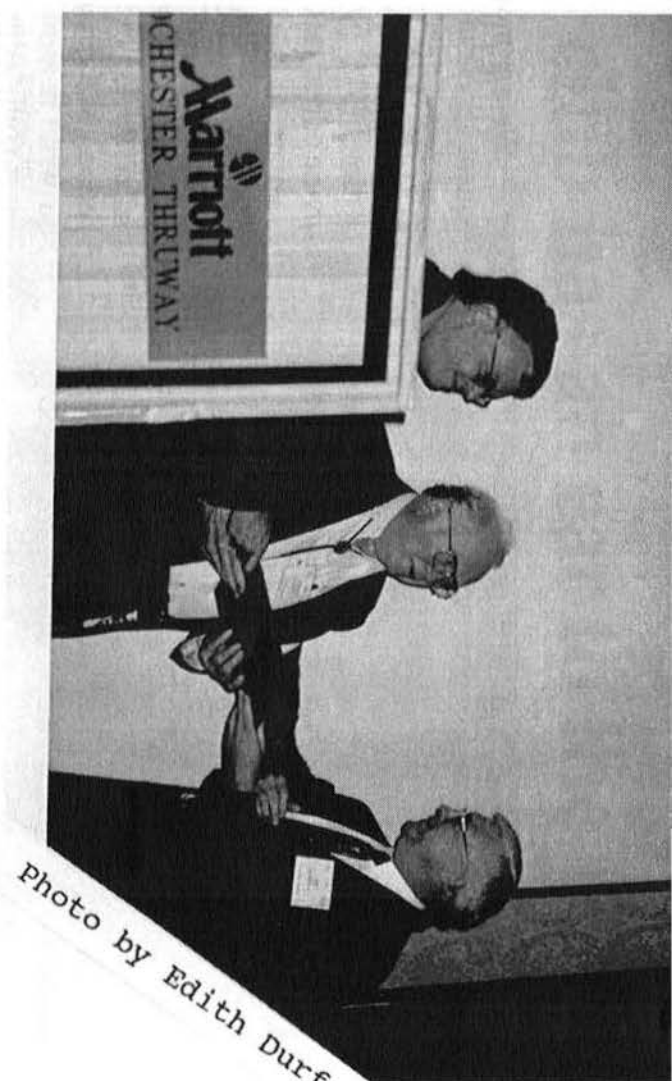
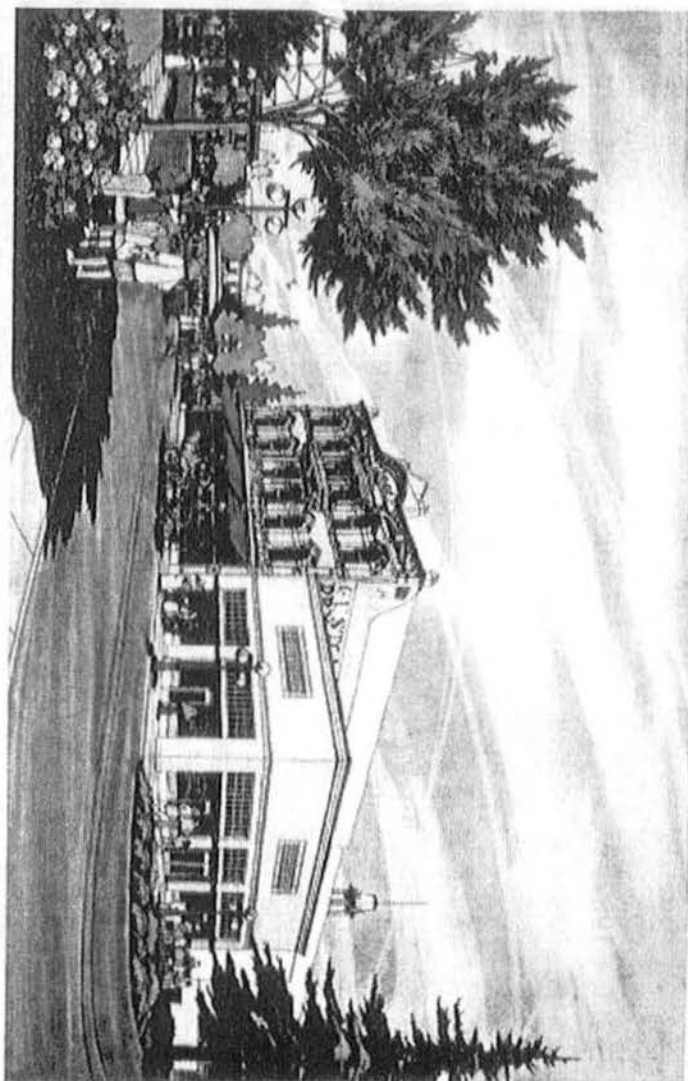
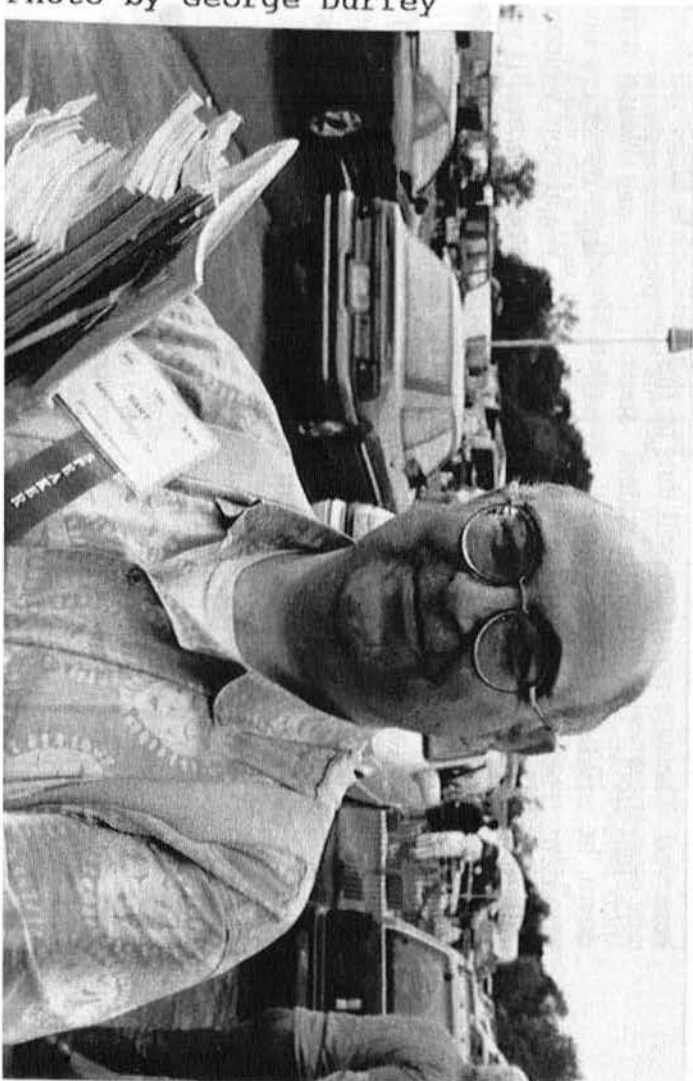


Photo by Edith Durfey

The A.W.A. also gave Mike Adams an award for his display of Doc Herrold broadcast microphone. CHRS members have received several A.W.A. awards in recent years. Last year (A.W.A.'s theme was WWII) Will Jensby received one for his encryption machine display (I was happy to contribute some of the graphics) and another for his intelligence documents display. Bjorn Forsberg received an award for his BC-721 (Glider handie-talkie) display.

Back to California, please welcome **Steve Kushman** as our new vice president. I have enjoyed serving in the vice president's capacity on and off since maybe 1987. We are, however, restructuring out of sort of a "back-up" vice-presidency to a new depth of leadership among the officers of CHRS. The Board of Directors and the membership have amended the By-Laws of CHRS to provide more continuity in administration. Henceforth, the Board will elect the officers (President, etc.) and appoint individuals or committees to other responsible positions (e.g., Journal Editor). The membership will elect the Board of Directors, who will select their own chairman. The vice-president will be appointed on condition of his taking over the presidency when the president in office seeks to step down, chooses not to seek the office in the next year, or is disabled or removed. The vice-president will thus be the president-elect. Once the president steps down, he will become the (immediate) past-president. The president will thus be able to call upon both the vice-president and the past-president for assistance as convenient. We will always know who the next president will be (subject the Board's discretion). First the president-elect (vice-president) and then the past-president will be available to perform the duties of the president as may be required by circumstance.

We are moving the *Journal* to more frequent appearance. I have been doing both the editing and the publishing but I am faced with all too many competing demands on my time (like paying the rent). We will provide edited text to one of our members to be set up as photoready copy. Publishing will then be done from that point of production. Mailing will then follow from printing, as it does now. We hope to do smaller issues, but more current, as if in a pipeline. We always want more articles! You write it (however sketchily) and we'll print it (fully edited).

The Association of North American Radio Clubs (A.N.A.R.C.) is looking favorably on our application to join, as authorized the C.H.R.S. Board of Directors. This is the umbrella organization for listeners' clubs, and they have demonstrated outstanding historical awareness with their Committee to Preserve Radio Verification (CPRV), chaired by short wave historian **Jerry Berg**. We will form valuable relationships by this association, and will have a voice on a possible Committee for Vintage Radio, looking to operation of old sets and circuits for monitoring today's bands as well as the history of short wave radio. The A.W.A. has a similar group dedicated to amateur radio operation with old transmitters and receivers.

Please write for this *Journal*, and send us letters on *every* old radio subject. We always welcome ideas and submissions. Your *Journal* is your club at work as well as its record. Provide illustrations and photos, especially of the author. Authors: please tell me the identity of the authors of the SX-62 note and the S-38C note. We will run them in the next *Journal* but want to give proper credit!

-- 73 -- , Bart.



Radio club has an ear to the past

Fans of early radio gather at Ampex lot

By HEIDI VAN ZANT

Times Staff Writer

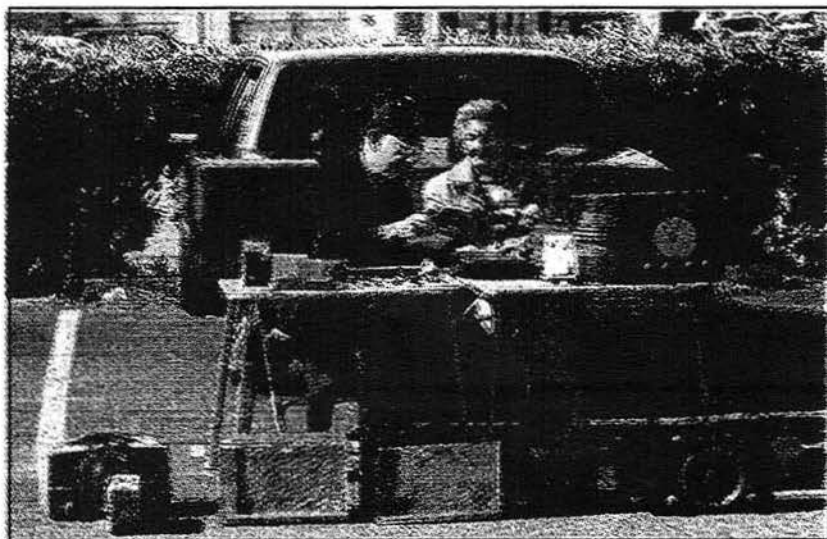
REDWOOD CITY — If your favorite thing to put on is the radio, you're not alone.

In living rooms and workshops across San Mateo County, an old radio is still the best way to listen to the music of yesteryear.

Several weekends a year, lovers of early radio days come out of the woodwork to gather in the Ampex Inc. parking lot to swap wares.

If this is a typical radio swap meet, they may go home with more than they came with — but radio buffs are like that.

This little voice in their head starts waxing poetic about how rich their favorite Big Band music would sound on that beautiful 1930s console, and they start peeling off \$5 bills.



JOHN GREEN/The Times

Peter and Carol Hughes display old radios at gathering.

"It's an amazing hobby. It's a growing hobby. Everybody has a little nostalgia about a radio," said Dale Sanford, president of the California Historical Radio Society in San Francisco.

His 360-member group meets periodically in the parking lot of Ampex in Redwood City, where radio lovers of all ages come from afar to share this unique

See RADIO, Page A2

Radio

Continued from Page One
passion.

Out of one trunk may come an amazing collection of breadboard style radios from the 1920s, when radio was in its infancy. From another, yellowed plastic bedstand models and small transistors from the 1960s.

From cutesy to classic, there seems to be a story behind every radio and a person who wants to hear it.

"You've got bikers and you've got neurosurgeons," said San Francisco attorney Bartholomew Lee, whose collection of 100 radios includes the first crystal set he received as a child.

Some come because they love history — others because they admire the look of the old radios with their warm mahogany sheens and big fat knobs.

"We had one of those consoles in the living room and we'd listen to 'Amos and Andy,'" said Carol Hughes of Los Altos Hills as a soft smile crossed her face.

Her home today has a radio in every room — usually tuned to a classical station — and a garage filled to the rafters with radios collected by her hobbyist husband, Peter.

"You wouldn't believe the stuff," said Mrs. Hughes, her eyes growing wide. "You can't get anything else in the garage. We have just a small path."

It's a common affliction for radiophiles, who have many eras of radio and some 85 years of inventory to collect from.

From the perspective of Carol Betush, who rose at 3 a.m. to travel with her husband from their Redding home to this antique-radio mecca, it's a peculiar world of vacuum tubes and wireless telegraphy that she has married into.

"These are the old audio and video guys from high school," she said with a laugh. "I don't have an innate love of these things other than the pretty ones."

Radio at one time was as common as today's television set — and just as apparently indispensable.

"It electrified the country, particularly the rural areas," Sanford said.

Whether it was getting information about crop prices and the weather forecast, or being entertained by "Fibber McGee and Molly," the radio quickly became part of the daily routine of American life some five decades ago.

But by the late 1940s, with the advent of television, use of radios in the homes decreased dramatically. The glory days of radio may have been over, but certainly not for "I'm lost in radio," said George Durfey of Portola Valley, a retired Stanford engineer who's been saving radios since the 1930s.

Members of the California Historical Radio Society, begun in 1974 as one of the first antique radio clubs in the nation, range from those who are casual weekend collectors to ones who have practically devoted their lives to this avocation.

Antiques dealer Everett Farey of San Anselmo, whose interest in short-wave radios led him to the club, said he "got hooked" about seven years ago.

"You get an interesting perspective on the world through the history of radios," he said. "Radios are a real part of American history — they were America's listening post."

This is not necessarily a bygone era for Farey, who tinkers on the old beauties as he listens to the comforting sounds of Big Band music.

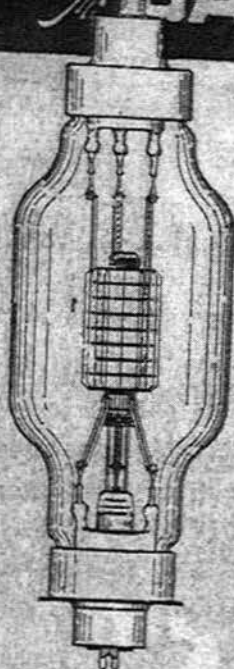
"When I go to my basement workshop, and turn on that music, there's nothing else happening in the world," he said.

★★★

The Times

Monday, May 22, 1995

GAMMATRON LINE



TYPE 3054
1500 Watts Plate Dissipation



TYPE 1554
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EASE OF EXCITATION
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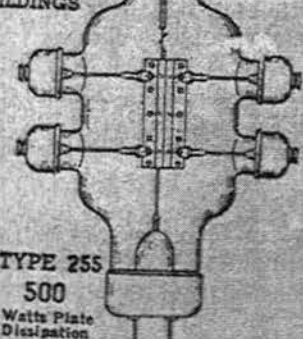
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TYPE 155
150 Watts Plate Dissipation



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HEINTZ AND KAUFMAN
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Figure 4 (to *On Hallowed Ground*): Advertisement, back cover, THE RADIO HANDBOOK FOR 1936, Published by Editors and Engineers, Inc. Heintz & Kaufman's ad from the 1936 West Coast Radio Handbook shows the South San Francisco plant, grid-less Gammatrons, and newer grid-type H&K tubes. The Gammatron trademark was used on all H&K tubes, even newer ones with grids. The only grid-less Gammatron to be made in production quantities was the HK255; the HK55 and HK155 are considered suspect, as depicted, by tube historians and collectors.

ON HALLOWED GROUND

-- a meditation of radio stations, vacuum tubes and the people involved.

by Hank Olson, W6GXN
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415 326 8149

In early 1993, Bill Orr, W6SAI, and I were doing research for our article on radio station KFS, Federal Telegraph, and Mackay. We took a short trip to Pacifica to see if there was anything left of the old Globe Wireless station KTK at Mussel Rock (Ref. 1). Mussel Rock is a large island-like rock, a few hundred feet off shore in the Pacific. As we stood on the cliff adjacent to the rock, Bill said, "I can't see any evidence of the old station, but I feel that we're on hallowed-ground."

As it happened, there was still some evidence of the old Globe Wireless site for its station KTK. This station was also known as MR or RK. These abbreviations stood for "Mussel Rock" or "Rock." They were each what old landline telegraphers and old wireless operators called a "sine" in the argot of commercial operators.

What is now the KTK site was sold to an architect in 1960 who modified it extensively. We had simply driven past the old KTK receiving site, in our haste to get close to the actual geographical site of "the Rock." The only thing today that seems to be immediately adjacent to Mussel Rock itself is a garbage dump transfer facility.

The architect to whom the old KTK receiver site was sold renovated it to become a very nice beach-front home. This home, on Palmetto Avenue is shown in Figure 1. Pictures of what KTK used to be are shown in Figures 2 and 3. The call,

KTK, is used as a sort of short-hand here, as the Globe Wireless site had a number of calls for point-to-point services. KTK, however, was their marine call, and was best known locally. In fact, even after the close of the MR site KTK became part of the Mackay (KFS) system. It continued to operate in the marine bands from its Lobitos site, south of Half Moon Bay for receiving and also its Palo Alto site for transmitting.

Globe Wireless was originally known as Dollaradio, a subsidiary of the Dollar Steamship line owned by old salt R. Stanley Dollar. It succeeded in the early days of high frequency radio, after the shift from long waves. Its success was due almost totally to the efforts and innovations of another part of the Dollar Steamship empire: Heintz and Kaufman. The driving technical force behind H&K and its communication company affiliate Globe Wireless, was Ralph Heintz, Sr. Ralph Heintz was one of the pioneers who showed that high frequency radio could reach great distances, that H.F. had a D.X. future. He built the tube-type equipment to demonstrate the fact.

After Dollar bought a controlling share of H&K stock and Dollaradio was formed as an exclusive radio communications company for the Dollar Steamship Line, Ralph Heintz found himself in the position of legal adversary of R.C.A. and the "Radio Trust." This so-called "Radio Trust" consisted of R.C.A., G.E., Westinghouse, A.T.&T. and United Fruit, to name the principals. Ralph Heintz was a very innovative ham operator and chemist-by-education. To get around the patents held by the "Radio Trust," he developed techniques that not only avoided the "Radio Trust" patents but brought many new directions to the transmitting tube industry. The modern transmitting tube industry owes



Figure 1A Former Old KTK Receiver Building at Salada Beach, south of Mussel Rock, now Pacifica. It is presently a private home.



Figure 1B Former Old KTK Receiver Building as seen from the beach.

much to these early efforts of Ralph Heintz, and his invention of new ways of building transmitting tubes. At the time transmitting tubes were simply large tubes using techniques borrowed from receiving tube technology. He changed that.

Heintz and Kaufman began life in modest quarters at 219 Natoma Street, S.F. It had formerly been a different H&K there: Heintz and Kohlmoos, of Ralph Heintz and his brother-in-law, Herman Kohlmoos. Once the newly-incorporated firm of Heintz and Kaufman began tooling up to make radio equipment for the Dollar Line, new production facilities were built in South San Francisco at 240 Dollar Avenue. The new plant had a distinctive saw-tooth roof-line, and is shown in Figure 4. This building still exists although its now a truck-tire facility. It can be seen from the S.P. Train, as one commutes to S.F. from the Peninsula. Ralph Heintz very carefully located his new plant close by an industrial railroad spur, for ease of receiving materials and shipping of finished radio equipment. The building as it now stands is shown in Figure 5.

When H&K began making H.F. transmitters for Dollar ships in 1928, they knew that the company would be in for a patent infringement fight, and so Ralph Heintz sought to find ways around the patents held by the "Radio Trust." Dollar and H&K purchased the financially ailing Simpson Radio Co. of Seattle. Dollar and H&K thereby gained the patents on two of Commodore Frederick Grant Simpson's radio circuits. Simpson had been Kilbourne and Clark's chief engineer, whose vacuum tube oscillator had withstood patent attack earlier. Heintz felt that these patents would allow H&K to go ahead with production of H.F. receivers and transmitters. These two patents (#1,199,243 and #1,507,689) were push-pull triode circuits for a regenerative

detector and for an oscillator/transmitter. The circuit patent problem had been solved, at least for present; but next R.C.A. refused to sell H&K any more tubes for their transmitters.

R.C.A.'s intransigence had also been anticipated by Ralph Heintz. He had developed his own type of triode, the grid-less Gammatron, which he had assured himself would operate in the push-pull Simpson Oscillator, before Simpson Radio Co. was acquired. The original Gammatrons had two plates, with a filament in between them; the plate closer to the filament was used as a control electrode, and the other plate (farther away from the filament and on the other side of it acted as the anode. This arrangement got around the basic triode patent of DeForest (#879,532), which stated that the grid (control electrode) was between the filament and plate. The only trouble with the H&K grid-less Gammatron was that only low mu tubes could be produced this way (i.e., mu's of 2 to 3.5).

But the Simpson Oscillator would operate very nicely with such low-mu tubes, and so H&K began producing a standard tube (HK255 Gammatron) and a standard transmitter (MC-201) for Dollar ships and Dollaradio shore stations. Each MC-201 used a pair of HK255's in a Simpson (power) oscillator.

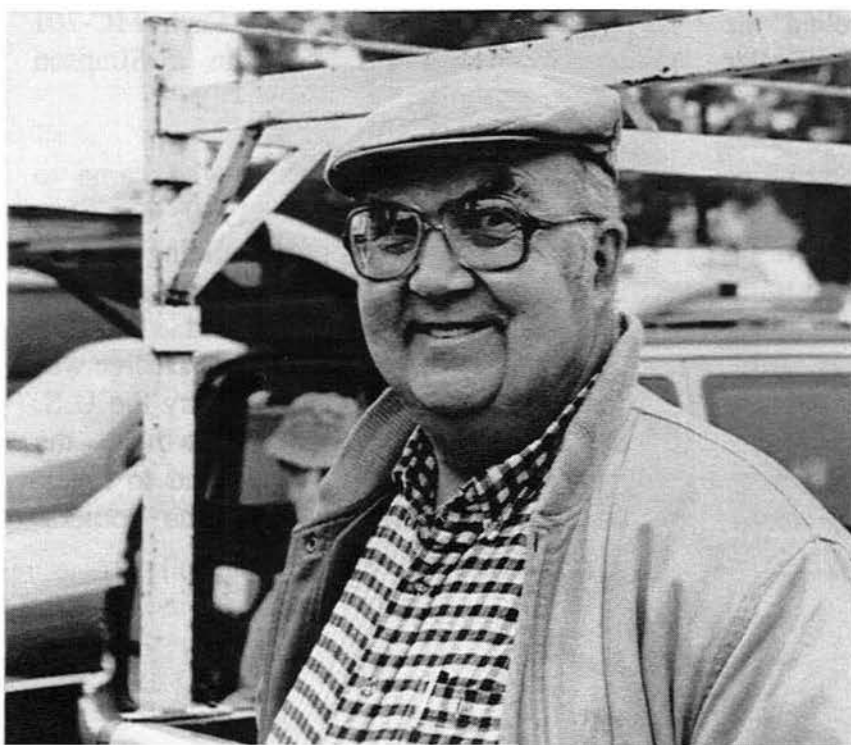
Two ham operators who came to work for H&K in 1929 and 1930, who were instrumental in the work of building the new Gammatron tubes were Bill Eitel and Jack McCullough (W6CHE and W6UF, respectively). In 1932 a Consent Decree was forced upon the "Radio Trust" by the U.S. Department of Justice by which, the members of the Radio Trust had to divest themselves of stock in each others'



Figure 2: Transmitter site of KTK, up-hill from Receiver Building, during demolition in 1961. West tower on ground. Site no longer exists, as hill-top was bulldozed away for tract home-sites. W6GXF (Ed Prather) Photo; original note: "West 250' Tower Dec '61."



Figure 3 receiver site of KTK, Salada Beach circa 1950's, tower is for water-well. (Globe Wireless Photo).



Author Hank Olson, W6GXN (Photo by George Durfey)

companies and cease only cross-licensing their patents exclusively with each other. H&K then started making conventional grid-type tubes.

Bill Eitel and Jack McCullough were intimately involved in fabricating the first grid-type triode to be marketed: the HK354. The HK354 was a real departure from the transmitting tubes of the day, using all the best tube techniques of the Radio Trust patents and the ones that H&K had evolved to defeat the Radio Trust patents. The HK354 had a hard-glass envelope, a thoriated tungsten filament, a tantalum anode, and a conventional grid that gave it a higher mu of about 11.

The hams at H&K immediately figured that they had a "winner" in the amateur radio transmitting tube market. They set about marketing it in 1934 in the magazine "Radio" and in the advertising pages of "Radio Handbook" of Editors and Engineers (Refs 2,3). But hardly had the HK354 ads appeared in print when R. Stanley Dollar put the kibosh on such ham-marketing. He held that the primary and exclusive mission of H&K was to see to the radio communication equipment needs of his ships and Dollaradio stations.

This edict was such a disappointing blow to the H&K hams, that it caused widespread demoralization. Shortly thereafter Bill Eitel and Jack McCullough quit the company. These two men started their own transmitting tube company in San Bruno, making a nearly identical tube to the HK354, calling it the Eimac 150T.

Meanwhile, back at the railroad-siding in South San Francisco, H&K continued to develop its tube line of both transmitting triodes and a newer line of transmitting pentodes. All of these tube

developments were reflected in ever-improved transmitters for Dollar's communication system.

World War II had a large effect on H&K as well as upon Eimac because the particular style of triodes that each made were immediately applicable to the early V.H.F. radars as ring-oscillators, etc. Both H&K and Eimac were pressed into service for the war effort to make such triodes as fast as three shifts a day could crank them out. Heaven only knows (the war production records probably won't tell us) how many 15E's, 304TL's, and other such tubes were made by these local plants during the period of 1942 to 1945.

Ralph Heintz left H&K in 1937, to later go into partnership with Bill Jack as "Jack and Heintz," which they started in Palo Alto at 3009 Middlefield Road (now the location of Winter Lodge Ice Rink). Ralph Heintz was a true renaissance-man. This time turned his efforts to aircraft engine-starters. After a short period at the Palo Alto plant, Jack and Heintz began having troubles with the local unions and decided to move to Cleveland, Ohio. (Bill Jack's hometown). They gathered all their loyal workers together and in one night packed up all the plant equipment and inventory and trucked it to freight cars at the Southern Pacific Railroad siding. By the time the pickets arrived the next morning, the freight cars were on their way to Cleveland, and the Union found itself picketing an empty plant.

During WWII, Jack and Heintz went on to produce not only aircraft starters but bomb-sights, automatic pilots and other electro-mechanical devices needed for the war effort. They were immensely successful, ending up with thousands of employees in Cleveland and having a major

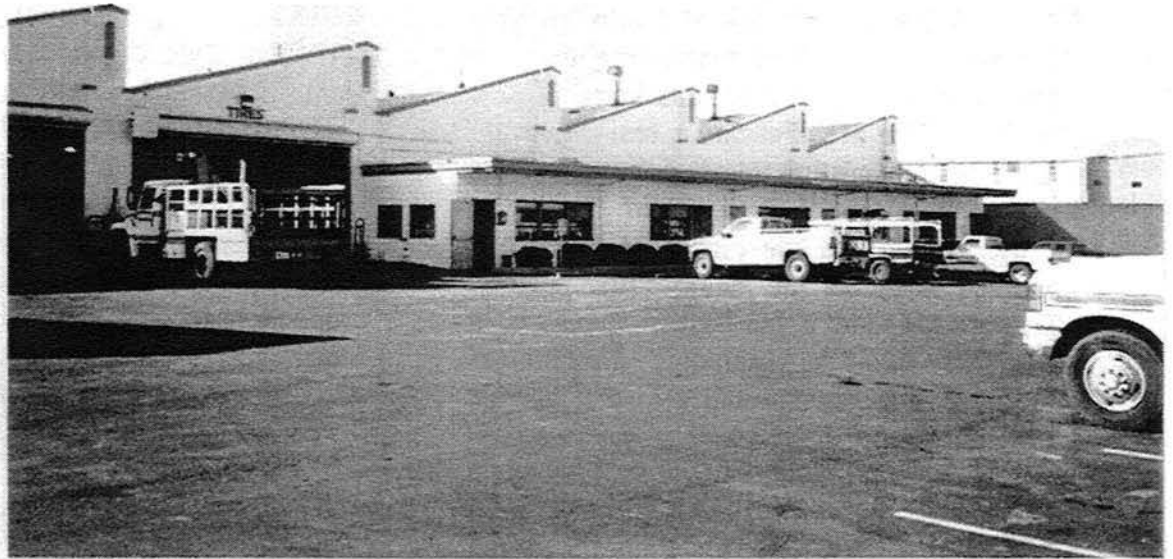


Figure 5 Former H&K plant at 240 Dollar Ave., SSF; now a truck tire facilities.
(Photo: Hank Olson W6GXN)



Figure 6 Last home of H&K at 947 Broadway, Redwood City; now a welder's supply house. (Photo: Hank Olson W6GXN)

influence in steering the thinking in military aircraft power systems toward high-frequency, 3-phase A.C. power (400 - 800 Hz).

When WWII was over, H&K and other firms faced adjustments to the changing market. H&K (Dollar) management chose down-sizing. They closed the South San Francisco plant and opened a smaller tube-making facility at 947 Broadway in Redwood City (within easy walking distance of the Ampex parking lot where C.H.R.S. holds its swap meets). For purposes of improving short-term cash flow, H&K took on an Army contract to make 3C24s. These were, however, mostly destined to be warehoused because they were replacements in obsolete V.H.F. radar systems. The H&K new development areas, like expansion of their HK257, -357 pentode family were neglected in favor of a dead-end contract to make obsolete triodes.

Eimac, on the other hand, opted for innovation and expansion; pursuing their vision of a low-drive, minimally-neutralized transmitting tube, the tetrode. The Eimac 4-65, 4-125, 4-250, and 4-400 were the results and were some of the most successful transmitting tubes ever made. They were copied by manufacturers all over the world. The pentode group at H&K, defeated by Dollar's conservative decisions, started their own company Pentalab, in Santa Barbara, and although late-in-the-game achieved some lasting successes in making pentode transmitting tubes. They were then absorbed by mega-corporation Raytheon. Some of the Pentalab types are still being produced by Eimac, for replacement service. The original HK257, also known as 4E27 or 8001, is also still produced by Eimac as the 5-125 as replacement tubes for industry.

The lessons of H&K and Eimac do not seem to have been learned even today, in a post-cold-war business environment. In a changing market, there are inherently great opportunities for expansion and the conservative down-sizing approach is usually a dead-end. -- 73 --

Acknowledgements and References --

The author wishes to thank Mort Brewer (W6JU); Ralph Heintz, Jr.; Paul Letsinger (W6SYL); Jim Maxwell (W6CF); Ron Martin (W6ZF); Mrs. Grace McCarthy (former Mayor of Pacifica); Bill Orr (W6SAI); and Ed Prather (W6GXF) for their help with the research that went into this article, and for their enthusiasm and encouragement. Ed Prather took one of the photos used as illustrations.

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MYSTERY MACHINE, a triumph of German Engineering

by Larry Clark
(CHRS Technical Advisor)
438 York Dr.
Benicia, CA 94510

Correspondence Welcomed

I'm interested in learning more about the German "Morse Writer" shown in the enclosed pictures. Does anyone one have any knowledge, articles, pictures regarding this machine? It is operating but I haven't found the narrow paper tape; I may have to cut my own.

I do know the following: It was made in 1938. Its base measures about 8-1/2 x 12 inches and it is about 7-1/2 inches tall. This machine records and sends outgoing messages. It does not receive incoming messages. The dots and dashes are printed in ink on 10 mm (3/8 inch) wide paper tape which travels about 1 meter per minute. The machine keys a voltage supply called "Fremdsommer" and sends it down the line to "Fernhorner." The serial number indicates these machines were quite common.

This electro-mechanical device appears technically primitive and poorly constructed. It seems unlikely that they could have survived any length of time in service. My machine appears unused, accounting perhaps for its survival.

I have these questions:

In what sort of installation or application was the machine used?

Was it as common as the serial number implies?

Were there separate reels for the paper tape?

What is the path of the paper tape external to machine?

What is purpose of hook on lower right of machine? (Lower left viewed from front)

Did it hold a roll of paper?

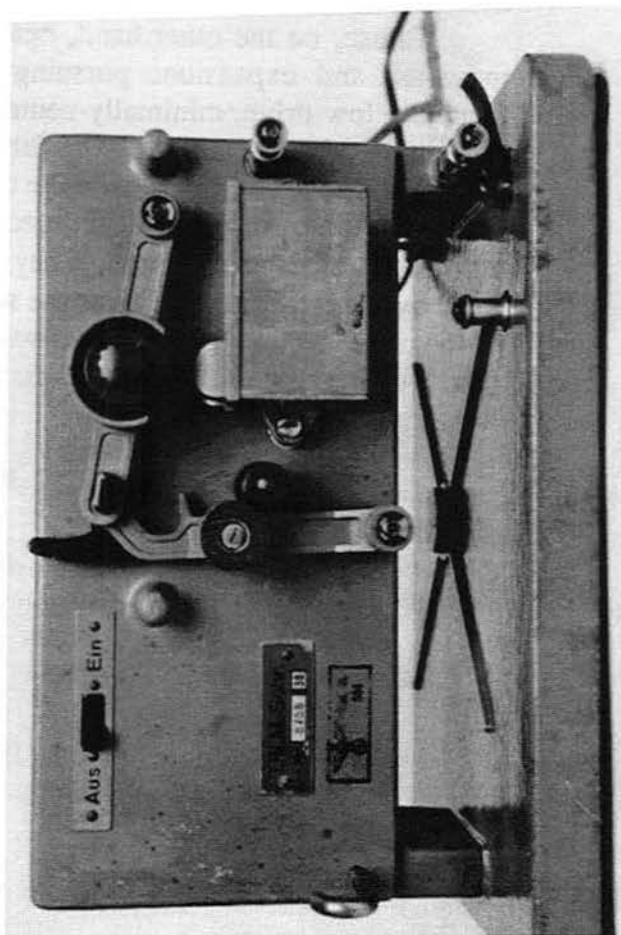
What was the "Fremdsommer" supply? Voltage? AC or DC? Frequency?

What is meaning or purpose of the Nazi stamp?

Is it an inspector's approval?

Any thoughts on finding the paper tape?

I'll appreciate any information anyone may have. Also, I would be grateful if anyone could let me know any recommendations of other people I should contact. Feel free to copy the illustrations and forward the pictures to your acquaintances for any help they might provide. -- 73 --



SAVE THE MARCONI POWERHOUSE AT BOLINAS!

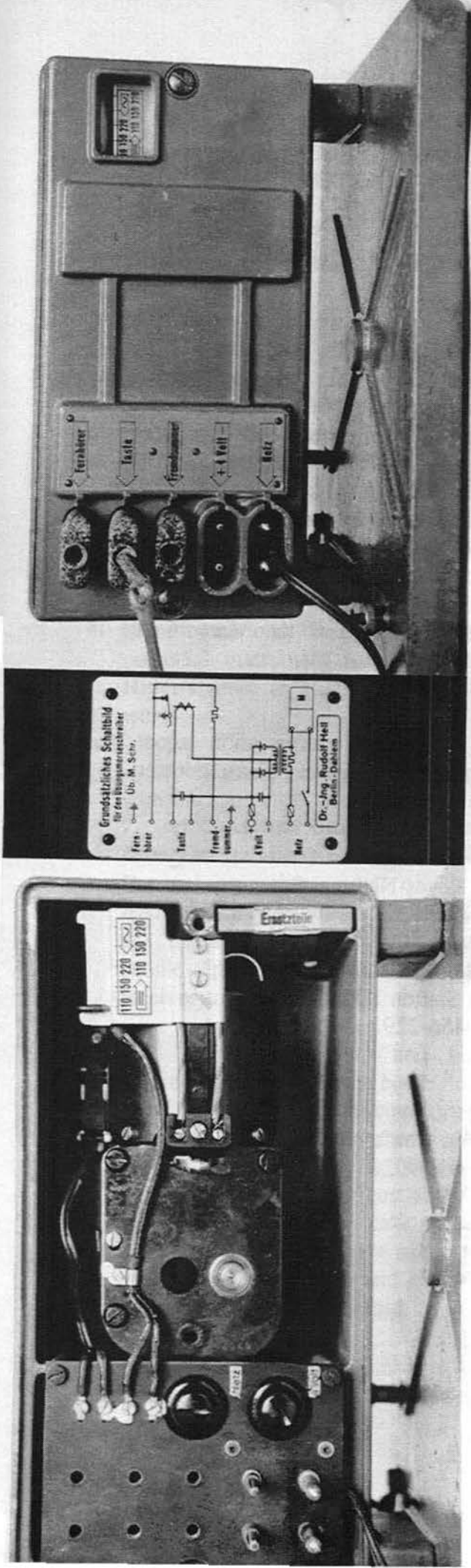
by Eric P. Dollard, KD6OSX
P.O. Box 644
Bollnas, CA 94924

Correspondence Welcomed

It has come time to consider preservation of the historic Marconi Powerhouse in Bollnas, California. The recent declaration of this structure as a National Historic Landmark introduces the requirement that it be maintained to prevent its deterioration. The historical importance of the Marconi communication facilities relates not only to the commercial development of the wireless, but also to the pioneering work of the scientists who made this possible. Here we find names like Einstein, Steinmetz and Tesla. The work of these scientists is of immense historical importance today.

At present, the Marconi Powerhouse, or Building Number One, as it is known today, is in the rapid process of deterioration. The principle cause is neglect. The occupation, and equipment removal, by various sorts has contributed greatly to this deteriorative process. Few have worked for preservation. This process is furthered by the recent shutdown of its radio equipment. The heat generated by this equipment helps to preserve the structure.

Clearly, the only occupants of this building should be those related to the establishment, maintenance and preservation of equipment, documents and artifacts from the Marconi and RCA Globecom eras. The present situation is incompatible with historic preservation. Considering that the California State Park companion Marconi site in Marshall, California is attempting to



reconstruct the wireless receivers, a similar plan needs to be adopted here at the Point Reyes National Seashore Bolinas site. The space becoming available in the Marconi building must begin the process for preservation.

The following proposal for utilization of the available space is called for at this time:

- A: Restoration of the utilities to the Marconi Building.
- B) Establishment of an engineering office to facilitate document storage, planning and maintenance.
- C) Removal of the junk and household effects which now litter the building.
- D) Construction of a scale model of Marconi's remarkable transmitting antenna. This antenna would be powered by the only remaining transmitter in the building, Model BL-10.

Licensed engineers and technicians, some with extensive experience in antique wireless systems, are available as volunteers at no cost to the National Park Service, on whose property the Marconi building is located. A 501(c)(3) tax exemption is established to facilitate equipment acquisition. Some equipment is already available for use. It can be expected that MCI, a tenant of this property, will assist in this endeavor.

We regard this plan as the only logical method to keep this facility functional and productive in the historical tradition established.

//
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THIS MATTER REQUIRES IMMEDIATE ATTENTION!

One of the two tenants of the Marconi Powerhouse, MCI Communications, would not renew its lease, which expired on December 31, 1994. Because 1995--'96 will mark the 100th Anniversary years of Marconi's first radio transmissions, it would be appropriate to begin the restoration process as soon as possible. The restored Marconi Powerhouse would serve as an excellent storage facility for the equipment, documents and artifacts being collected from around the world's Marconi sites. This collection could support exhibits presented at the Marconi site in Marshall.

For more information about the circumstances involved, please contact:

Dewey Livingston
Point Reyes National Seashore
(415) 663-8522

Radio Station KPH
(800) 456-2291

Wayne Zion
Marconi Conference Center
(415) 663-9020

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GERMAN VOLKSEMPFANGERS People's Radios

by Norman Cox
1550 Waltham Rd.
Concord, CA 94520
((510) 682-4592), and

Jurgen Weingarten
Germany.

Correspondence Welcomed

In 1933 while most of us in the United States were listening to Amos n' Andy or Lowell Thomas on our Philco Baby Grands, Nazi Propaganda Minister Joseph Goebbels began popularizing a different brand of radio in Germany. He saw it as a powerful instrument for the spreading of Hitler's ideas at home and throughout the world.

His international campaign began with the start up of a 40,000 watt station in Zeesen. At that time it was one of the strongest stations in Europe with its six "beams" covering most of the world. Approximately 40 million radio sets were in use throughout Europe with many more people having occasional access to a receiver to listen in.

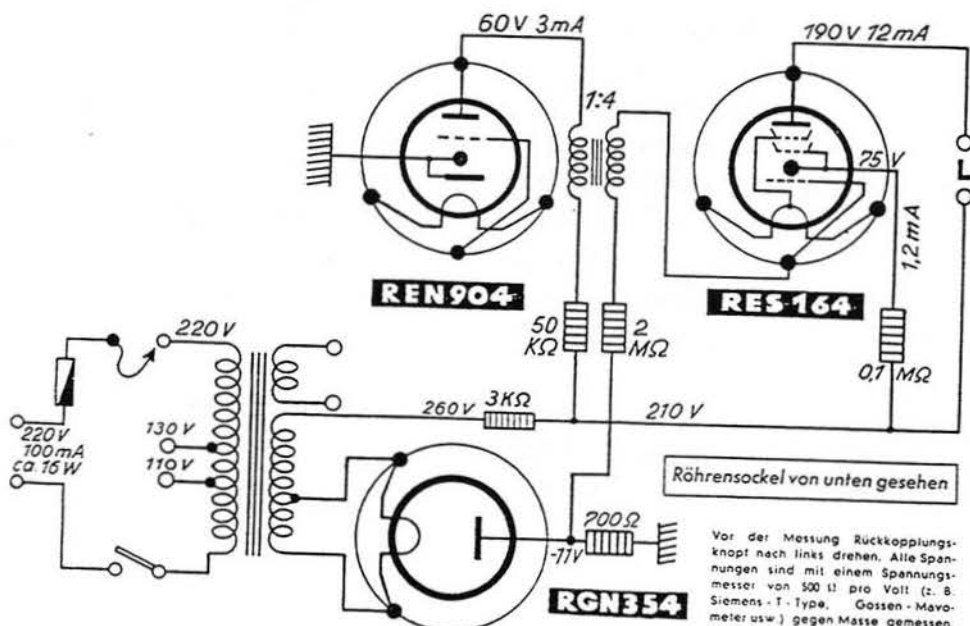
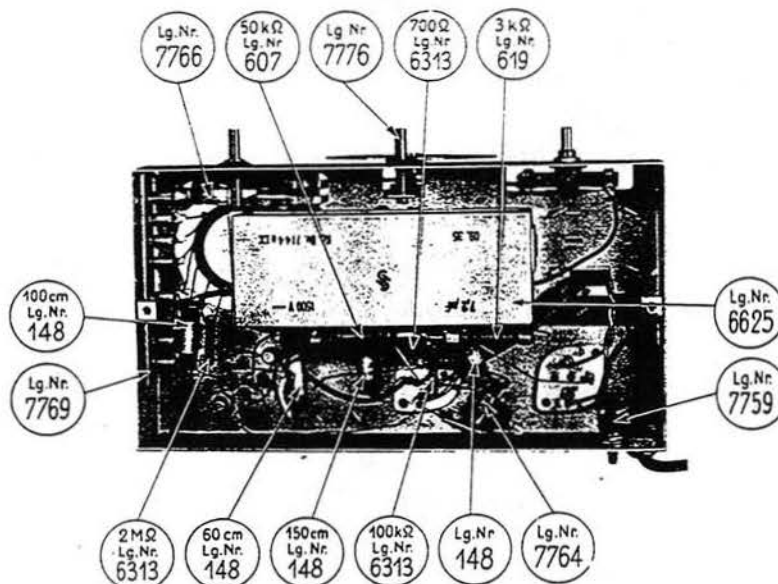
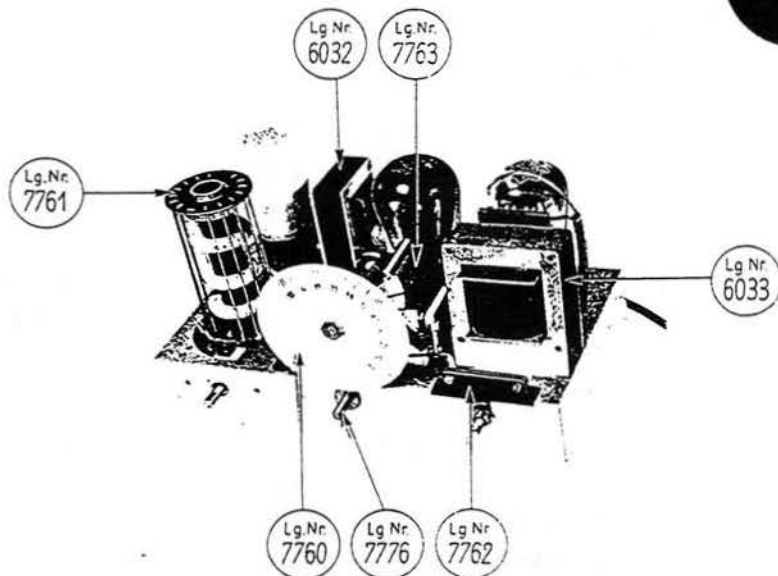
With Zeesen up and running it became important that the Nazis next get the word out to all of their countrymen. Dr. Goebbels had the Reichsrundfunkammer (German Network Ministry) draw up some specifications for a low cost radio and had them sent out to the nation's 28 radio manufacturers. They were asked to submit their ideas for a simple and cheap receiver for every German household.

On August 18, 1933 at a special radio exhibition in Berlin, the winning

receiver was introduced to the public. the Ministry designated the radio as a model VE301W. The VE was the abbreviation for Volksempfanger (Peoples Receiver) and the 301 marked the date that Hitler became Chancellor (30th of January). The W indicated Wechselstrom (a/c powered). Additional models would be designated VE301G (Gleichstrom) for d/c and VE301B (Batteriebetrieb) for battery operation. All German radio manufacturers from that day forward were ordered to produce the new Volksempfangers along with their own models.

The first VE301's were priced at 76 Reichsmark which put them in the \$5.00 U.S. range. The cabinets, still good looking today after 50 years plus, were made either of wood or of the new Bakelite. Unlike Dr. Porsche's promised Volkswagen, these radios were immediately available to everyone. Over 100,000 sets were sold on the first day of the exhibition and they were by far, up to that time, the most popular receiver ever sold in Germany. During its five years of life, to December 31, 1937, there were 2,652,223 of the two and three tube sets produced.

In 1938 two new Volksempfangers were introduced to replace the now aging original VE301s. One set was designated as a model VE301DYN. Advances in radio technology meant that the original VE301's brought out five years previously were lacking in the quality of reproduction available with the other receivers being produced by German manufacturers. With the addition of a new dynamic speaker, this updated model (at a slightly higher price) was a partial answer to the demands of an audience that now used their radios not only for information but entertainment as well.



Also by 1938 the assimilation of the popular VE301's and many other makes of radios into everyday German life had become a double-edged sword. Now, not only could 8,500,000 radios be tuned in to the latest words of their leaders, but with a little longer antenna and a twist of the dial, listeners could also hear Stalin from Moscow or the BBC (although keeping to its all English format) from Britain.

Probably due to the ease which Germans could tune in to the rest of the world, a second radio, much smaller in power, was put into production. This model was a DKE38, (Deutscher-Klein-Empfänger) with 38 for the year. It had one combined tetrode and triode tube (VCL11) and one rectifier which meant that only local stations could be heard. The case was made of a non strategic material, pressed paper. It was promptly nicknamed "Goebbel's Schnauze" (Goebbel's Snout). It sold for 35 Reichsmark which at the time was about \$3.00 U.S. In order to reduce critical man hours that would normally be spent assembling these radios in a factory, these sets were mostly assembled at home by women doing their part for the war effort. Approximately 200,000 of the DKE38's were built in this manner.

Mr. Jurgen Weingarten of Germany, who contributed much information for this article, has one working example of each of the three Volksempfänger in his collection. These once popular radios were once pervasive in most German's lives. The Nazis produced them in the millions. They are now, however, according to Jurgen, hard to find. He is always on the lookout for spare parts to keep his sets running. If one of the sets is found and is offered for sale in working order, it can command prices over US\$200, depending on the model and condition.

At the war's end, the VE's had become obsolete and most of the originally inexpensive sets were thrown away rather than being repaired. By this time more powerful and technically advanced radios had become legal availability. Also, while the Nazi radios were sitting on a table in the kitchen or living room, they were constant reminders of many recent bad times for Germany. Just like someone who constantly brings you bad news, Germans no longer welcomed these Nazi radios in their homes.

Regarding the nearby reproduction of the advertisement, I took the ad to the local library and after two hours of work with three German to English dictionaries, I came up with what could be loosely called a translation.

"All Germany can listen to their leaders with the People's Radio. ¶ You can listen to such joyful sounds as the celebration of the Berlin Torchlight Parade at the time of Hitler's appointment to the Chancellorship. The beautiful 1933 model People's Utility Radio Set is hand made and is within everyone's price range. Listening to your local stations as well as the German Government stations is now made possible."

Someone who knows German might get a couple of laughs over the above effort. However, I would be glad to hear from anyone who might have a better translation.

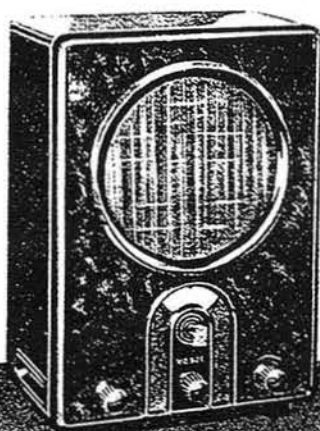
-- 73 --

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Brochure from Deutschlands
Kommunikationsgesellschaft, Telekom, The
Literary Digest of June 26, 1937

„Tag der Nationalen Arbeit“

VOLKSEMPFÄNGER VE 301



Dieses auf Vorschlag des Reichsministeriums für Volksaufklärung und Propaganda von der gesamten deutschen Radio-Industrie einheitlich hergestellte Empfangsgerät mit eingebautem Freischwinger-Lautsprecher bringt überall im Reich lautstark und klangrein mindestens den Bezirks- und Deutschlandsender, bei guten Empfangsbedingungen, in den Abendstunden, aber auch noch eine Reihe anderer starker Sender.

Hochwertige Einzelteile, verlustarme Schwingkreise, modernste Kondensatoren bewirken hohe Trennschärfe und große Reichweite.

Das Wechselstrom- und Gleichstromgerät ist mit 2 Röhren ausgerüstet; das Gerät für Batteriebetrieb hat 3 Röhren.

Für Wechselstrom wird der Volksempfänger in elegantem Bakelitgehäuse geliefert, für Gleichstrom und Batteriebetrieb in poliertem Holzgehäuse.

Für Wechselstrom VE 301W RM 76,- mit Röhren

Für Gleichstrom VE 301G RM 76,- mit Röhren

Für Batteriebetrieb VE 301 B RM 65,- mit Röhren
ohne Batterien

AEG

RADIO WARS, 1937 - '45

By Norman Glen Cox
1550 Waltham Rd
Concord, CA 94520

Correspondence Welcomed

An undeclared radio war of words was started in 1933 when Germany began, under the direction of Minister of Propaganda Joseph Goebbels, bombarding the rest of Europe with its specialized brand of misinformation. The main purpose at first was to present its own political and social ideologies to anyone that would listen. Later the broadcasts were to be used to weaken the resolve of any nation that might stand in its way. In the end the broadcasts were used to try to divide the different allied armies as they advanced against Germany.

At first these broadcasts went mostly unanswered. By 1937 the other European nations noticed their effectiveness in the Spanish Civil War. These nations began arming themselves with high-powered transmitters and began beaming their own brand of propaganda to Germany and the rest of the world.

In June, 1937 the 500,000 watt station in Russia started one of their counter attacks by beaming, in German: "*Achtung! Achtung! Hier spricht Moskau.*" This time they did not get beyond their initial blast.

A German station popped onto the Komintern's wavelength and set up a loud buzzing and humming and stopped the harangue on the iniquities of Nazism at home and abroad.

At the end of the hour when the clock in Moscow's Red Square struck and

the *Internationale* was played, the jamming stopped because the voice of Moscow was now speaking Russian again. The Russians could now send out, as far as the Third Reich was concerned, whatever they wanted. This time the battle between governments with widely diverse views ended up in a stalemate. The German Government, however, was not always this successful and it was apparent that they no longer fully controlled the behemoth they had conceived just four short years prior.

Trying to regain some form of control, the Nazi government would forbid its citizens to listen to any broadcasts from Russia. The BBC, keeping to its all English format, was not the major concern at this time. Moscow, broadcasting its own form of Communist propaganda in German, to the 750,000 Germans within Russian borders and directly to Germany, was felt to be more of a threat. If you were Polish, Czechoslovakian or Russian and living in Germany, you were not legally allowed to own a radio. To buy a radio, all persons would have to present documentation that they were German in order to get the government's authorizing license.

To further add to the woes of National Socialism in 1937, as many as a half dozen "mystery stations", in areas controlled by Germany, started broadcasting their own brand of anti-fascist propaganda to their countrymen. While the rest of Europe was snickering behind their hands, the illegal broadcasts were causing Goebbels some measure of embarrassment and he was kept busy having his agents scramble to locate and disable these outlaws.

Also, in 1937, Italy's *Il Duce*, Benito Mussolini, was starting to get the radio bug and was adding his own brand of propaganda to the multi-flavored European broadcast-



1933
1945

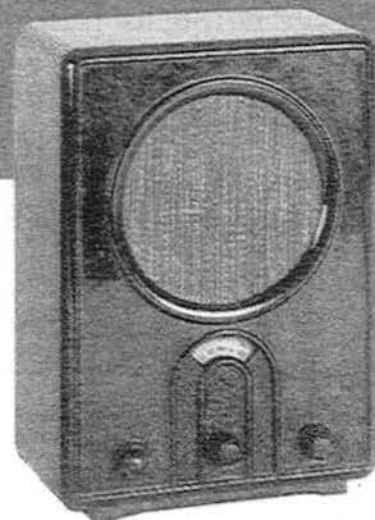
Der „heraufschallende Jubel“ wurde anlässlich des Berliner Fackelzugs übertragen, am Tag, als Hitler Reichskanzler wurde. Schon ab 1933 wird der „Volksempfänger“ VE 301 gebaut - für jedermann erschwinglich. Er sollte überall den Tagesempfang des jeweiligen Bezirkssenders und des Deutschlandsenders ermöglichen.

Ganz Deutschland
hört den Führer



mit dem Volksempfänger

Der „VE 301“



Ein

ing stew. At this time, although not one of the big voices of the continent, his station still had the ability to pick at a couple of sore spots of the British Empire, namely Palestine and India.

By August 1940 the German Luftwaffe was taking part in attempts to give credence to a pseudo British propaganda group calling itself the New British Broadcasting Station (NBBS). Flying over the Midlands and the lower part of Scotland, they dropped, by parachute, portable transmitters, some explosives, maps and lists of names and addresses of high government officials ostensibly marked for assassination. The next day the NBBS announcer followed up the Luftwaffe's drop of supplies with the information that there had been a nighttime drop of secret agents.

The program might have been received with some credibility if they had not made such totally unbelievable statements about the non-existent spies. The fictional agents, supposedly dressed as civilians and British soldiers, were said to be armed with capsules that could, when activated, produce clouds of fog to help them avoid capture or they were supposedly armed with electromagnetic death rays.

"Mystery stations" were still plaguing Dr. Goebbels in September 1941. One clandestine short-wave station calling itself *Gustav Siegfried Eins* began sending out anti-Nazi propaganda from somewhere inside Germany. The announcer called himself "The Chief" and his messages, while still mostly anti-Communist in theme, were also directed against the SA and the SS groups and the ease with which they were being awarded the Iron Cross for non military deeds. An analysis of the contents of this show by the people routinely monitoring anything coming out of Germany, led them

to suspect a group of old, disgruntled Army officers of the German monarchist school that the Nazi parade had passed by.

During this same time period in 1941 the German long-wave station Deutschlandsender found its official newscasts being interrupted by a voice from Russia that laughed, sang derisive songs and injected its own comments in German every time their announcer took a breath: "Lies!" "A fairy tale!" "Says you!" This improved jamming technique was traced to the powerful transmitter RWL at Noginsk, 30 miles from Moscow. The broadcasts were, of course, heard in Britain where the public, tuning in mainly for the entertainment value of the show, promptly nicknamed the voice *Der Snag*:

Announcer: Italian planes scored hits on British ships...

Der Snag: Don't make me laugh...

Announcer: The Luftwaffe again attacked British airfields...

Der Snag: Says you!

Announcer: British bombers attempted to raid...

Der Snag: You Bet!

The Nazis tried to jam out the voice, but only succeeded in jamming out their own broadcasts. One night they put three newscasters on at the same time, one after the other, without a break, to foil the Russian station but they talked so fast that nobody could understand what they were saying.

The effect of radio propaganda being beamed out of other European countries and raining down on Germany was now being felt by Herr Goebbels. The BBC, with its all English format, had its stations sending out shows typically reflecting an entertain-

ment slant and a bulldog determination. The popularity of these shows in Germany had become a problem to the Nazi hierarchy and in September 1941 Goebbels commented on them.

"Some Germans say they are strong minded enough to listen to British lies and not be harmed by them. I reply this is not true. British lies get into the blood, making listeners weak and tired of carrying on, thus showing that the poisons transmitted by the British Broadcasting Corporation are beginning to work".

By January 1945 the German misinformation machine was fine tuned and in high gear. At this time one of the main thrusts of its activities was to attempt to split the unity of the Allies advancing on them from all sides. The attempts were unexpectedly successful.

American troops fighting on the western front, thinking they were listening to the BBC, were upset when they heard the news commentator gave the British full credit for stopping the German offensive in the Ardennes. The commentator went on to say that the Americans were disorganized and bewildered until Field Marshal Montgomery took over their scattered forces and stopped the German drive.

The troops had actually been listening to a Nazi commentator. German transmitters would pick up the real BBC news programs and relay them to the areas where troops were advancing. The broadcasts would proceed with normal openings and announcements and then the German station would seamlessly cut off the BBC and substitute its own version of the days news with veddy British sounding announcers and

when over would switch back to the regular closing of the BBC show. So skillfully was the "ersatz" newscast inserted that monitors of the show in New York, on this occasion, assumed they were hearing the real thing. The next day *The New York Daily Mirror* newspaper, also having been taken in, featured the show's misinformation with blazing headlines: "MONTY GETS THE GLORY, YANKS GET THE BRUSHOFF".

Whole programs, all dressed up in fake BBC finery, were now routinely being broadcast and in many cases were successfully driving wedges into Allied unity. Soldiers, hearing what they thought was the BBC, would retell their version of the fake news to any friends who had not heard the newscasts, further spreading the lies. Only radio experts could detect the change-overs.

In March 1945 the vise around Germany was tightening. One of the most valuable objectives taken during the American sweep through Luxembourg was the mostly intact radio transmitter known as Radio Luxembourg which the Germans used to cover all of Europe. The Americans didn't even let the transmitter or the announcers' chairs cool down. They jumped in with both feet and immediately started sending out their own information over the same frequency.

In several instances the new station managers would fill the same German time slot with a show based on format of the original show. One of these popular German shows was called the Story of the Day. Under the Americans the program still gave out the inside story of a news topic of the day but this time with material being supplied by Army Intelligence. One special show, aired by the Americans, was an actual off-the-cuff talk by Himmler to a group of army officers where he told them to use the utmost brutality in dealing with their own

men. How the talk itself was obtained and how it made its way into American hands must have been a good spy story on its own.

On another occasion the Story of the Day played a full recording of the surrender of German General Elster and his 19,000 men near Orleans. The record, made at the scene, included Elster's voice as he handed over his pistol to his captors. The show ended with his happy troops singing in prison camp now that their war was over.

New shows from Radio Luxembourg now included English lessons for troops to use when surrendering or if captured. "I am wounded", "Please give me some water" and "Yes, I like cigarettes" were a few of the phrases. On the air the "captured" soldiers would describe how well fed and well clothed they were and would urge their comrades to come join them. Excerpts of letters to home, taken from the soldiers at the time of their surrender or capture, were routinely read. The letters dealt mostly with feelings of melancholy and longing for home or the enormous weariness of the war. Many German soldiers coming over to the Allied lines would mention that Radio Luxembourg's broadcasts were factors leading to their decision to give up.

With the end near, the German radio propaganda machine that began with so much splash and noise twelve short years ago in 1933, was now reduced to meaningless exhortations to keep up the fight with new and deadly wonder weapons promised soon to save the day. Yet the far off sounds of enemy gunfire coming closer and closer to home could not be covered up with more words and soon the radio wars would end along with the shooting wars.

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HINTS AND KINKS

Eye tubes, '01A substitutes and bypassing transformers.

by Norman R. Leal
1485 Naples Way
Livermore, CA 94550

Eye Tubes:

Good eye tubes such as 6E5 and 6U5 are getting harder to find. Many of the old ones still have filaments but have lost most of their green glow.

You can increase the green by a slight modification of the circuit. These tubes were originally specified for operation on 250 volts. By increasing the voltage on the target, pin 4, on dim eye tubes they may again be useable. I have tested some weak "eye" tubes to 1000 volts and have not had a problem.

To increase the brightness pin 4 should be connected to a higher voltage in the radio. If the radio doesn't have a higher voltage, the addition of a diode, capacitor and resistor should add around 100 volts. Most radios use an 80 for rectified. This tube has a high voltage drop and in addition, the rest of the radio circuit loads the voltage down.

Connect a 100 ohm resistor, for protection, to one of the 80 tube plates. The other end of the resistor to the anode of a diode (1000piv). The cathode of the diode should go to the positive end of a 10 mfd 450 volt cap. The negative end of the cap goes to ground in the radio. Now remove the wire which connects pin 4 of the eye to B+ and connect pin 4 to the junction of the diode and 10 mfd cap.

The actual voltage on the eye will be slightly less than 1.4 times the AC plate voltage on the 80. The higher the voltage on the eye tube, the larger the AVC voltage needed to close the eye. The 6E5 tube is more sensitive than the 6U5 or 6G5 and will have more movement when tuning in a station.

If you notice no movement of the eye when tuning in a strong station, either the AVC voltage is missing or a small 1 meg resistor built into the 6E5/6U5 socket is open. This resistor is between pins 2 and 4 and needs to be replaced if it is open.

A voltage doubler can be used on a radio that doesn't have a high enough AC voltage such as AC/DC radios. The doubler can be made up of two diodes and two capacitors. Again, a resistor should be used for protection.

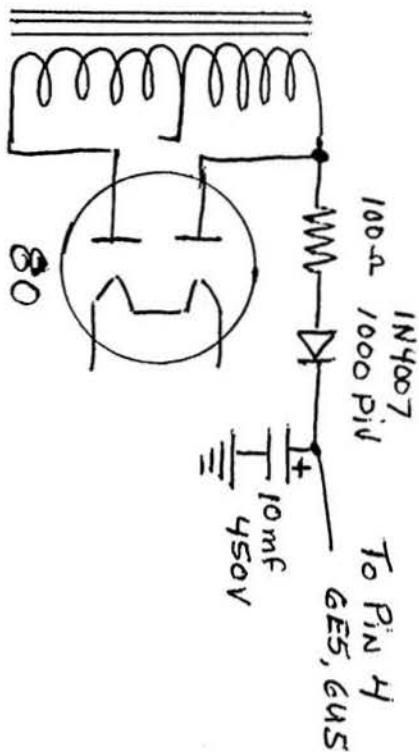
The 1629 tube can be used to replace 6U5, 6E5, 6G5, etc. tuning eyes if you make an adapter and increase the filament voltage to 12 volts. At first it seems like another filament transformer must be added but this is not necessary.

The 1629 as well as most tubes will operate on AC or DC for the filament voltage. For AC radios you can make a simple voltage doubler that will convert the 6.3 volt filament of the original tuning eye tube to over 12 volts DC for the 1629.

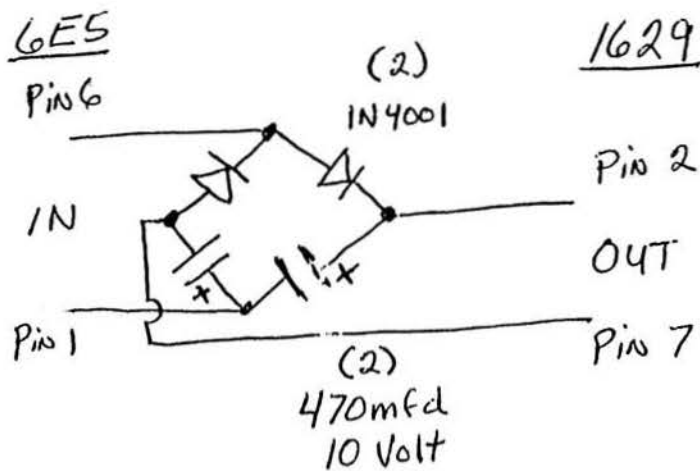
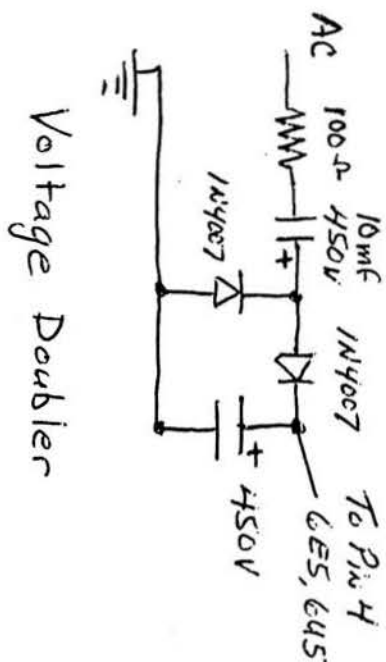
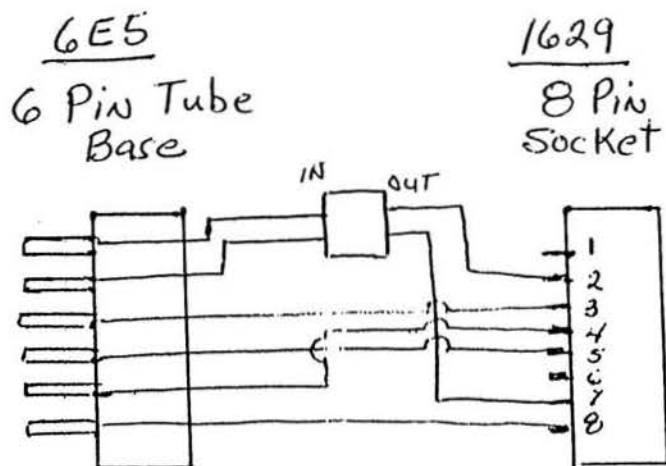
To make the doubler two 470 mfd capacitors and two 1N4001 or similar diodes are required. See the diagram nearby.

Using the types 30 and 31 as replacement tubes:

The 30 will replace 01A, X99, WX12 and most other amplifier tubes which



To make the doubler 2 470mfd capacitors and 2 1N4001 or similar diodes are required. See below:



have "4D" basing. The 31 will replace 20 and 71A in early battery sets.

As long as the sockets in the radio are not dependent on the side bayonet pins and you are willing to change the filament voltage, the 30 and 31 tubes make excellent replacements in early battery radios. These tubes are presently available new at reasonable prices.

Early radios usually have a rheostat to control the volume. This rheostat will not have the same action when using 30's as replacement for the higher filament current 01A's. To correct this, you can either add a load resistor across the filament pins in the radio or use a variable supply for the filament. In any case, the performance of the radio should improve as the 30 and 31 have slightly higher gain than the other tubes.

The tube data (at the end of this note) was taken from a 1957 CBS Tube Manual and only shows operation at a specific plate voltage.

Advantages:

1. Cost - The tubes are available new at reasonable prices.
2. Uniformity - Electrically and mechanically the 30/31 are more uniform. You will not need to move tubes around to find which ones work best in which sockets. It is easier to find a set of tubes that have the same physical appearance.
3. Microphonics - Microphonics will be reduced.
4. "A" Supply - It is much easier and less expensive to build an "A"

supply for 2 volts @ .5 amps than 5 volts @ 2 amps.

5. Overall - Performance will improve as the gain per stage multiplies not just adds.

Tubes that have thoriated-tungsten filaments with low emission sometimes can be reactivated. These tubes, like the 01A, can usually be identified by their bright filaments.

Test a weak tube then operate the filament at a slightly increased voltage without plate potential for a few minutes and retest at the original setting. If there is some improvement, again apply the increased filament voltage for an hour or so and note the improvement. In some cases, it may take overnight for maximum recovery. If no improvement was noticed, use a slightly higher filament voltage.

The 01A operates with 5 volts on the filament. A voltage of 5.5 to 6.0 is usually enough to increase emission. Do not go above 6 volts as this can have the opposite effect reducing emission and can burn out the tube. I have had the best success with RCA and Cuningham tubes sometimes bringing the emission to the level of new tubes. Some tubes will not recover.

Emission in some other tubes like the 26 and 71A may also be improved by a different method. On these after testing make the tube draw excessive plate current. This can be done by making the grid positive and increasing the filament voltage if necessary. This can be done on a tube tester like the EICO 666 or other setup capable of high current.

Under these conditions the plate current will start to increase. In the case of

the 26 and 71A, a green color may appear between the filament and plate. If the green color is noticed, the tube probably has increased emission. Do not keep these high current conditions on the tube for more than a minute or so. Remove power, let the tube cool and retest.

Distortion in a radio is generally caused by leaky audio coupling capacitors. Even the slightest leakage can cause a problem and if not corrected will damage the output tube and can overheat the power transformer.

The plate of one stage is coupled to the grid of the next with a capacitor. The plate has a positive voltage while the grid requires a negative bias. A leaky cap causes the grid to run positive and the tube to draw excessive current.

To determine if this is a problem, measure the grid voltage in relation to the cathode of the tube using a high impedance meter, 20000 ohm or VTVM, as not to load down the voltage. For most AC/DC radios, the voltage on the output tube grid should be -6 to -8 volts. For radios using 6F6, 42 or other tubes with higher voltage on the plates, the grid voltage will be -15 to -20 volts. Some tubes like 45's and 71's may have -50 volt grids but these are usually transformer coupled.

If the grid voltage isn't negative enough or is positive replace the coupling cap. Use a good quality cap which shows no measurable leakage on the highest scale of an ohmmeter. Most radios use caps around .01 mfd. A radio will have a better low frequency response if a larger value is used, .05 mfd to 0.1 mfd.

At the same time, the cap is being replaced check the grid resistor. The grid

resistors on the output tubes should not exceed .5 meg. Some resistors increase value over time and some radios used values exceeding .5 meg which is not recommended for most output tubes. If the resistor reads high replace it with one of the same or lower value.

By-passing defective audio and IF transformers:

Information on repairing radios with defective audio interstage or IF transformers without replacing them follows.

May VT Tubes cross reference to the same standard numbers but not all. A copy of the 1945 Army Cross Reference and a list of patent numbers with the year issued also follows. Older radio parts sometimes have patent numbers but may not have manufacturing dates. This will let a person know the maximum age of a part.

A radio with defective Audio Interstage or Intermediate Frequency Transformer can often be repaired without replacing or rewinding the transformer. For many of us, it is difficult to find a replacement that fits and we may not be set up to rewind transformer. In the case of IF Transformers, the early radios did not standardize on a frequency and an exact replacement may be nearly impossible to find.

The transformer coupling can usually be replaced by capacitor/resistor coupling often without any loss of performance.

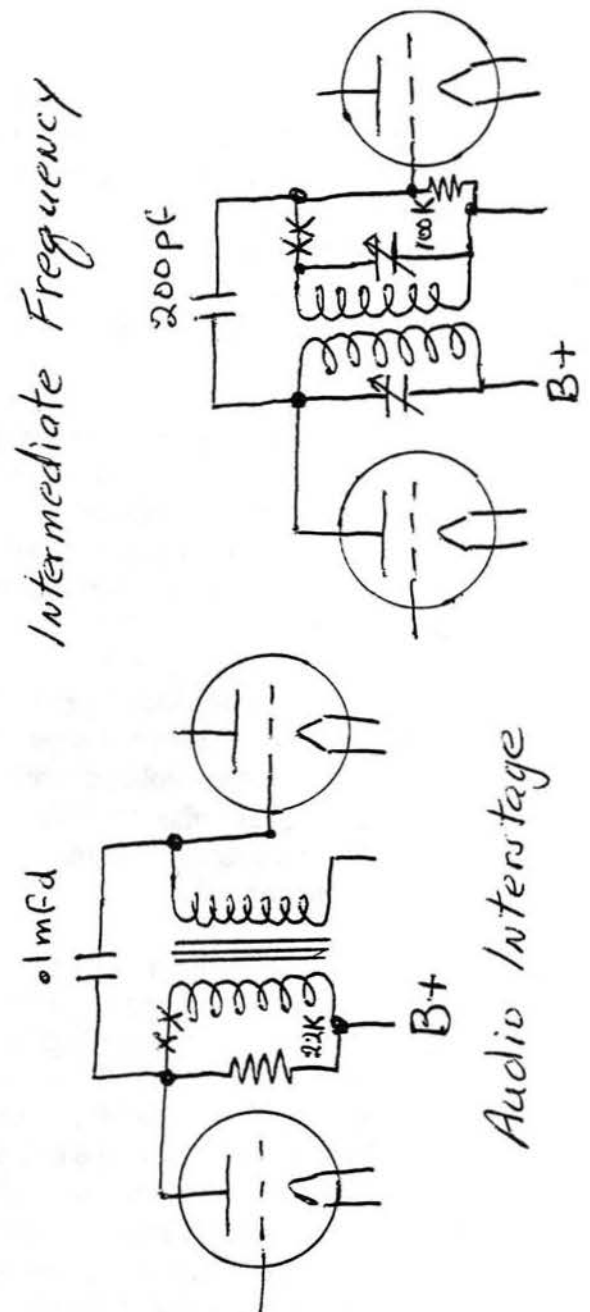
In the case of Audio Interstage Transformers, connect a capacitor from the plate of the driving tube to the driven tube grid. The value is not critical. I suggest 0.1 mfd at 400 volts.

Then bypass the open winding with a resistor. Again the value is not critical. If the plate to B+ side is open, try using a 22K at 1 watt. If the grid winding is open, a 100K 1/2 watt will work.

I think you will be surprised at the results. The frequency response will probably be better than the original circuit.

You may do the same with Intermediate Frequency Transformers. With IF Transformers use small capacitors between the plate of the driving tube to the grid of the driven tube. This will allow the peaking of the one side of the transformer which is still working. In this case, capacitor values around 200 pf will usually work.

Again, the resistor value used to bypass the open winding is not critical. The same values used for Audio Frequency circuits will work. I have suggested rather low resistance values so almost any circuit will work. In the case of tetrode tubes like the 24A, it is important to keep the plate voltage above the screen and tubes like the Triode 27 should also be used with fairly low plate resistors. -- 73 --



Tube	Fil V	Amps	Plate V	Ma.	Grid	Gain	mmho	Plate res
01	5.0	1.00	90	2.5	-4.5	8	725	11,000
01A	5.0	.25	90	2.5	-4.5	8	725	11,000
01B	5.0	.125	90	2.5	-4.5	8	725	11,000
12A	5.0	.25	90	5.0	-4.5	8.5	1575	5,400
X99	3.3	.063	90	2.5	-4.5	6.6	425	15,500
WX12	1.1	.25	90	2.5	-4.5	6.6	425	15,500
30	2.0	.06	90	2.5	-4.5	9.3	850	11,000
31	2.0	.13	135	8.0	-22.5	3.8	925	
20	3.3	.132	135	6.0	-22.5	3.5	600	
71	5.0	.50	135	17.0	-27.0	3.0	1650	
71A	5.0	.25	135	17.0	-27.0	3.0	1650	
71B	5.0	.125	135	17.0	-27.0	3.0	1650	

The above data was taken from a 1957 CBS Tube Manual and only shows operation at a specific plate voltage for comparison. All of these tubes can be operated at other plate voltages and will be shown that way in tube manuals.

RADIO INTELLIGENCE DEVELOPMENTS DURING WORLD WAR ONE AND BETWEEN THE WARS

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WORLD WAR ONE WIRELESS INTERCEPT SERVICES:

By 1914, radio communications, or wireless telegraphy as these communications were then known, were used by the world's military and naval forces. The relationships of frequency or wavelength, power, directivity and range were not well understood. Signals officers and commanders in the field and at headquarters rarely took into account the possibility of interception, or deception. The troops and sailors of the European nations soon bore the costs of such negligence.

IN 1914 BRITISH RADIO OPERATORS ORGANIZED AS THE BASIS OF THE ROYAL NAVY RADIO INTERCEPT SER- VICE, FEEDING TRAFFIC TO ADMIRAL- TY ROOM 40 FOR CRYPTANALYSIS AND PROVIDING THE FOUNDATION FOR THE WORLD WAR ONE SUCCESS OF BRITISH INTELLIGENCE:

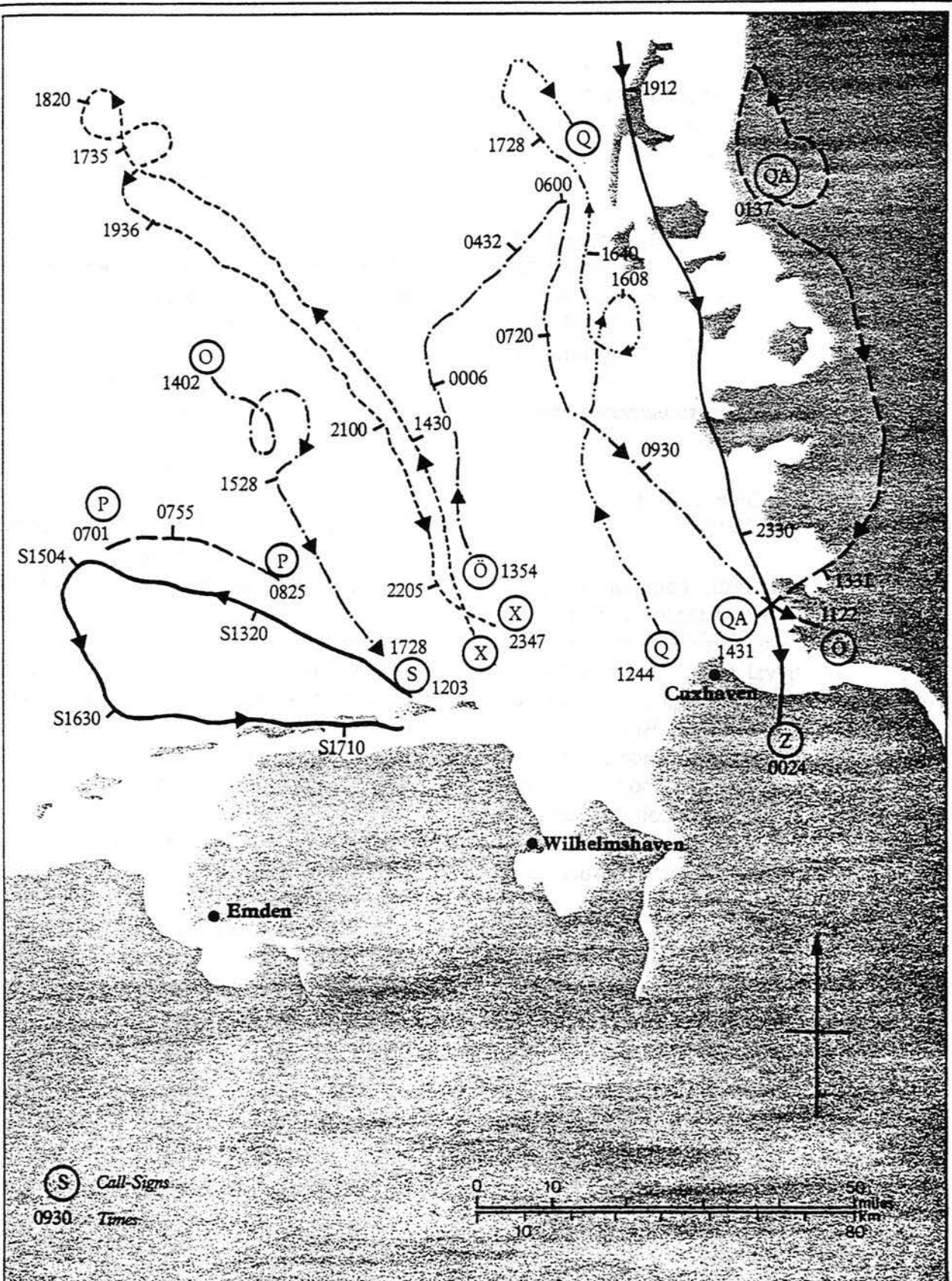
Maurice Wright became a Marconi engineer in England in 1912 (and was later Engineer in Chief). Wright experimented with the then new triode vacuum tube in a radio receiving circuit in 1914. Two days before the outbreak of hostilities in August

of 1914, he received German wireless traffic. He worked with Captain H. J. Round, (later a colleague and supporter of Major E. H. Armstrong after America entered the war). Their circuit details are lost to time, but it was undoubtedly a regenerative configuration, for it "made the interception of long range communications possible for the first time" as later reported by Peter Wright, Maurice's son, a high official in the British Counter Intelligence Service (MI-5) during the cold war. [1]

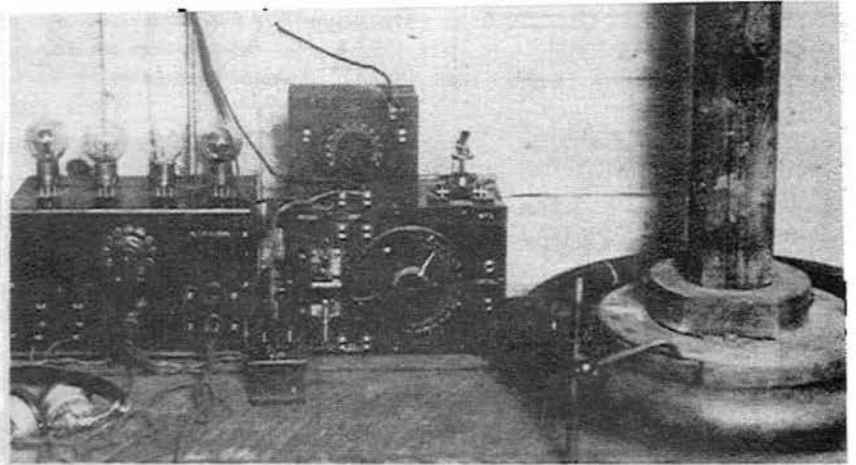
Working at his lab at Marconi at Chelmsford, Wright realized he was listening to the German Navy. He got the intercepts to Captain Reggie Hall of Naval Intelligence. Hall realized the bonanza in his hands, and put Wright to work building a chain of intercept stations for the Admiralty. [1]. Wright and Round also developed aperiodic direction finding techniques to track the German fleet, proving sufficient warning for the British fleet to engage it on the high seas. In the process, Wright established a clandestine intercept station in Norway in 1915. [1].

The intercept stations set up in this effort were known as the "Y" stations. Marconi receiving stations, British Post Office stations and an Admiralty "police" station all provided intercepts to Hall's Room 40 codebreakers. These stations were soon joined by enthusiastic amateurs. Barrister Russell Clarke and Col. Richard Hippisley had been logging intercepts of German traffic at their amateur stations in London and Wales. They so reported, and went to work for Hall. New intercept stations soon went up on the coast. Soon practically all German naval wireless traffic also found its way to Room 40. [2;3].

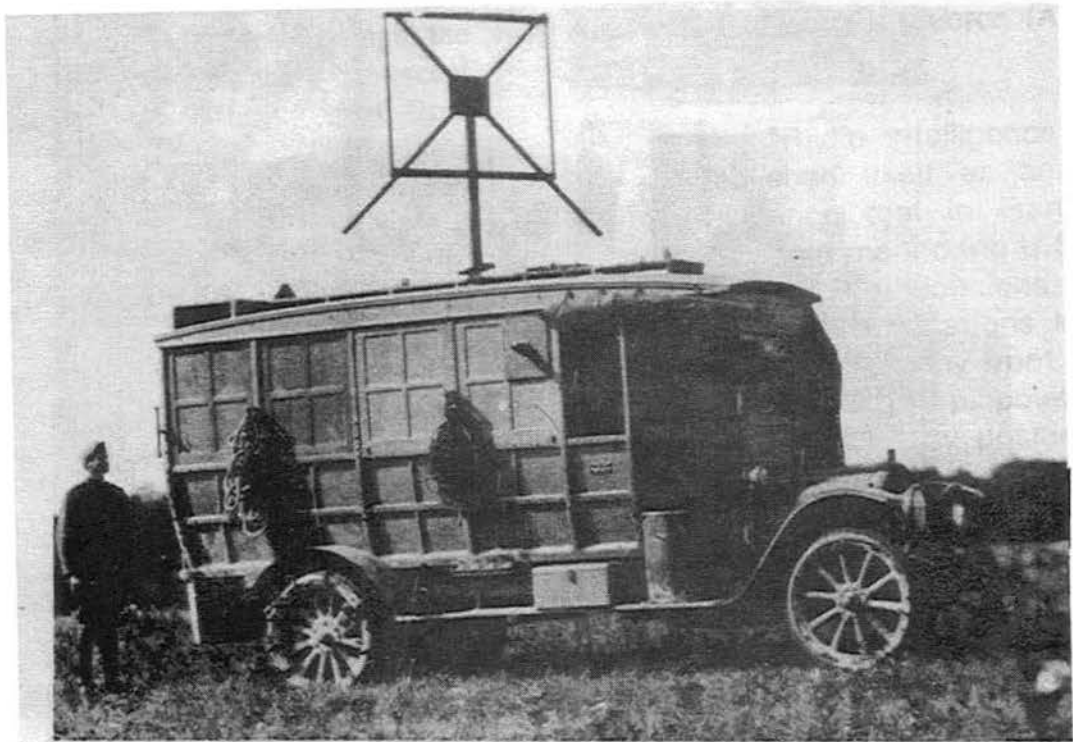
The German high power long wave station at Norddeich provided fodder for the



Zeppelin scouting formations over the North Sea on the day before the battle of Jutland plotted from direction-finding bearings taken by Marconi intercept stations in France
(Marconi Company Archive)



Interior shot of a DF position. This was a French set used for training at the II Corps Signal School in France.



A mobile van used for radio direction-finding (DF) near Verdun, France, in 1918.

station, and the whole effort began as an amateur and even sporting endeavor of the operators with time on their hands. [7].

TACTICAL INTERCEPTS BY ALL BELLIGERENT SIGNAL SERVICES PROVIDE IMPORTANT BATTLEFIELD INTELLIGENCE, BUT RADIO DECEPTION BECOMES A WEAPON:

In early September, 1914 the Russians intercepted a message from German Army Staff Headquarters from which the Russians inferred a threat from a new large force, and therefore held back forces of their own in the upcoming battle. The German Eighth Army staff, however, anticipating interception, had transmitted in plain text from its station at Koenigsberg the completely false message. [7].

Radio deception thus began to play its counterpoint to radio interception at the commencement of the festivities. The Germans used radio deception again successfully within weeks.

The Battle of Tannenberg taught the Germans the value of their nascent intercept efforts. The Russian traffic was read from August 1914 to the close of 1915. One Russian General officer termed the Russians use of plain text and failure to take precautions "unpardonable negligence." [7]. The Austrians had integrated their intercept service into their Chancellery cryptographic section at the beginning of the war. [7]. They regularly intercepted and decrypted Russian traffic all throughout the war.

The Germans made in the West the very errors from which they profited in the East. The French even before the war strove to intercept relevant traffic. At the beginning of the war in the West, the Germans sought to thrust into France to defeat the French armies east of Paris. The French had the whole order of battle by radio inter-

cepts, and up to the minute tactical intelligence. Just as the Russian thrust failed in the East for want of radio discipline, so to the German thrust in the West turned to defeat at the Battle of the Marne for exactly the same reasons. [7].

After these failures to achieve early decisive victories, the war degenerated into trenches, artillery and gassing, for four horrible years. The superior material and manpower of the allies, with the entrance of the United States in April, 1917, turned the tide. The United States also joined the war in the ether. In 1918, the U.S. Army Signal Corps established its first long range intercept station in Maine, to listen to Europe, under Lt. Arthur E. Boeder. [8]. American "Y" stations (although that was only the British nomenclature) monitored Nauen's transmissions to German agents in Mexico and South America. [2].

The U.S. Army had used mobile intercept stations as well as land stations as early as 1916 on the Mexican border, and well into the 20s. [9]. Army Intelligence brought its pre-war expertise with it in the American Expeditionary Force (AEF) to France.

"Radio intelligence firmly established itself as an Army intelligence tool in France. In addition to monitoring U.S. traffic for security violations, Signal Corp intercept stations located all along the enemy front copied enemy traffic and pinpointed the location of enemy positions by goniometric radio direction finding. Intercepted traffic was passed to radio intelligence sections at General Headquarters and with the two field armies, where specialists analyzed message flow patterns and attempt-



ed to decrypt the messages themselves." [10].

Illustrations appear nearby of a U.S. Army mobile stations in France and a French training station. Also nearby is a photo of an Army station in France with G.S. Corpe standing in the middle behind the operator. [11]. Mr. Corpe had been an early (1912) United Wireless operator at Avalon on Catalina Island off Los Angeles, the first American circuit to handle paid wireless traffic some 15 years before. He captioned this photo:

"U.S. Signal Corps Army Receiving Station France, 1918. W6LM in center, standing with Head Phones. Close to where Major Armstrong developed Super Het Circuits."

Wireless in the Army also became fodder for the WW I patriotism mills, as the 1917 postcard nearby illustrates: "FOR THE SAKE OF OLD GLORY: Sending a Wireless Message" is the caption, and it does imply that Signal Corps men wore side arms (rather than carry rifles along with radios).

BETWEEN THE WARS:

Downsizing was the aftermath of the Great War's end, as it is of all wars. Intercept services and intelligence functions shrank. There were, however, soon untoward "consequences of the peace" (to use Lord Keynes' phrase). As wireless and radio came to play a part in the unfolding events, so did radio interception.

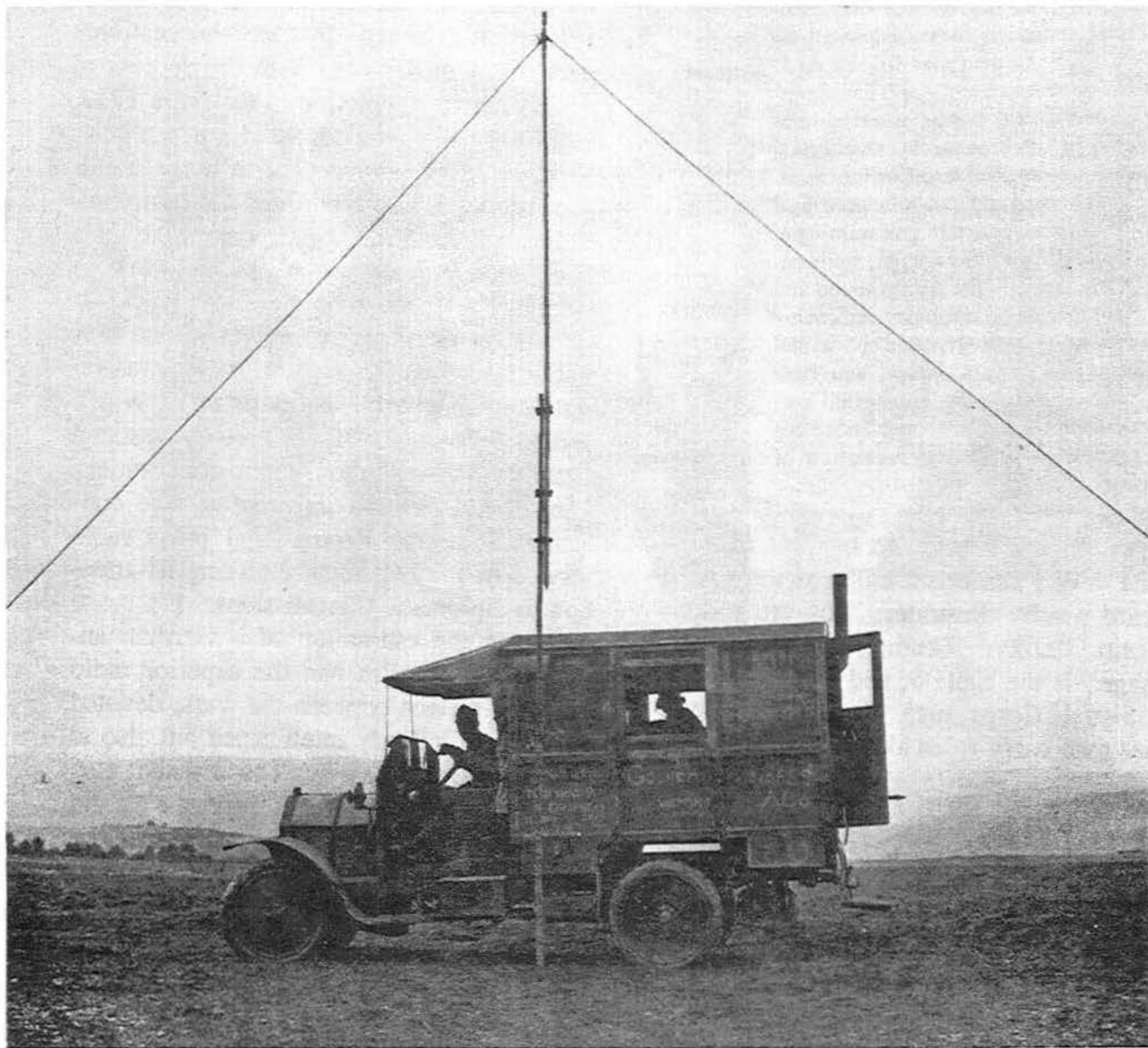
THE BRITISH CONTINUE TO MONITOR AND DECRYPT, ESPECIALLY SOVIET SUBVERSION IN THE 1920S.

At the close of the First World War, the allies turned their attention not only to the nations of the world, but also to the subversion worked by the international communist movement. With the success of the Bolshevik Revolution in Russia in 1917, all of the Great Powers faced a new threat, revolution from within. The military intelligence services also monitored the communications of the Reds. Nearby is photo of a U.S. mobile intercept station at work in Germany after the end of the war. [10].

The Germans themselves valued their military intelligence section, which was re-instituted on a permanent basis in 1919. [6]. Within Germany itself, the Free-corps set up a monitoring station to listen to communists. The official German intercept service concentrated on the international press radio service to 1925, gradually turning its attention to diplomatic transmissions. [7].

In the estimation of a German authority, the English had the superior radio intercept service between the wars, devoted not only to military intelligence but also to diplomatic traffic. [7]. The French also maintained their intercept service, as did other nations. The Russians maintained the best discipline and were perhaps the most effective. The Poles more than held their own. The Italians ran a lax operation, and other nations had only indifferent success. [7].

In October, 1919 the English organized the Government Code and Cipher School (GCCS) amalgamating Room 40 of the Admiralty and Military Intelligence. To support its work, the English formed the Royal Corps of Signals, which in conjunction with Admiralty monitoring, provided the messages for the codebreakers. [3]. The British Secret Service also took to putting its



An AEF mobile intercept unit positioned in Germany after the conclusion of the war.

agents aboard merchant ships as Marconi wireless operators, when particular ports of call were of interest. [1].

Soviet subversion in England provided its first important work, with civil unrest widely feared. The *London Times* ran a story that wireless intercepts showed the Soviets funding subversive activity in August of 1920. Despite a treaty prohibiting domestic subversion, the Soviets kept it up, monitored in detail by the wireless intercept stations and decrypted at GCCS. [3]. Various diplomatic initiatives attenuated the subversion for a while but also brought on the use of one-time encoding pads, very difficult to decrypt. [3]. In 1930 an intercept station detected a circuit between Moscow and a suburb of London. [3]. It was not until the Spanish Civil War in 1936 that the British turned away from their focus on the Soviets. (It is, incidentally, my speculation that the circuit between Moscow and London, fully decrypted by GCCS, was left in place to monitor the success of Comintern subversion at Cambridge and Oxford, which led to the Philby affair many years later. [12].

The Russians had dedicated themselves to the overthrow of the United Kingdom, and the English knew it, from intercepts and seized documents. [1]. The English first, however, had to deal with the Nazis, who had even more immediate plans, as became clear in 1936, 1938 and 1939.

The English maintained since 1925 a "Y" committee to coordinate the work of intercepting radio signals. The Army had its chain of stations throughout the Empire, as did the Navy. The Post Office and the Air Ministry ran domestic stations. [3]. The listeners heard and logged the traffic, but understanding it was another matter, for the Nazis had implemented Enigma machine encoding. With the coming of real war, only the Poles had made any progress. The story of the decryption of the Enigma traffic

is well known. [3;4]. That work may well have won the war in Europe; it certainly contributed far beyond its cost. What is not widely known is that enemy radio operators' errors gave away the codes far more than even the new electronic computers could break them. This was true and known to be true from the earliest days of encryption of wireless messages.

An American World War II Communications Security poster quotes the following First War example in order to heighten security awareness among U.S. operators:

"As early as 1914 the German station at Norddeich sent out by telegraph regular weather reports in mixed text. In these the cipher clerks had not taken the trouble to encipher the letters and numbers ordinarily used for indicating the direction and strength of the wind, etc.

"The station at Brugge, on the contrary, committed the inexcusable stupidity of transmitting the same telegram after having enciphered the said figures and letters. A comparison of the two telegrams gave an exceedingly valuable clue to the code used, and permitted ... a gradual reconstruction of great parts of it." [10;13].

Discipline is the key to security.

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THE U.S. ARMY AND NAVY CONTINUE MONITORING IN THE 1920S AND '30S, FEEDING TRAFFIC TO THE "BLACK CHAMBER" THEN THE SIGNAL INTELLIGENCE SERVICE, FOR CRYPTANALYSIS, ESPECIALLY JAPANESE DIPLOMATIC COMMUNICATIONS.

Until 1929, American military intelligence fed radio intercepts to the "Black Chamber" of Major Herbert O. Yardley. Secretary of War Henry Stimson was scandalized at this spying and put an end to it rather abruptly. He said later: "Gentlemen do not read each other's mail." Yardley's success in decryption went for naught, and he went public in 1931 in the *Saturday Evening Post* and a book. [3].

Part of the American success had borne fruit at the 1921 Washington Peace Conference. Army Military Intelligence (MI-8) codebreakers decrypted the Japanese diplomatic code, for a considerable negotiating advantage. [10]. The Army on a tactical level also engaged in monitoring and direction finding, as is illustrated by the 1940 set pictured nearby as it was operated in Hawaii.

The U.S. Navy also focused on the Japanese (as to some extent had the British as well). In 1927 (later Admiral) Ellis Zacharias set up a monitoring station at Shanghai, the first of a chain across the Pacific. [15]. Zacharias set up his receivers on the fourth floor of the American Consulate. [8]. By 1940 the chain of stations included the Aleutians Islands, the Philippines at Corregidor, Samoa, Guam and Hawaii [8;15] and Bainbridge Island, WA, Winter Harbor, ME, Jupiter, FL and Chelton on Oahu. [3]. The Navy also established lesser monitoring stations at Imperial beach, CA and Amagansett, L.I., NY. [8].

The Army, despite the closing of the Black Chamber, operated the Signal Intelli-

gence Service shortly thereafter. The brilliant William Friedman ran the small group, which ultimately broke the Japanese Purple Code, providing the MAGIC decrypts that likely won the war in the Pacific. [10;3]. Friedman broke that code without any captured machines or codebooks (unlike the English success at the Enigma codes). Friedman's was an unequalled feat of mind that nearly cost him his. [3].

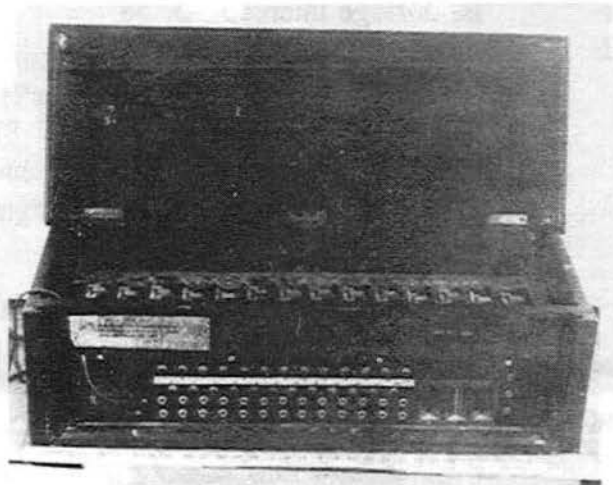
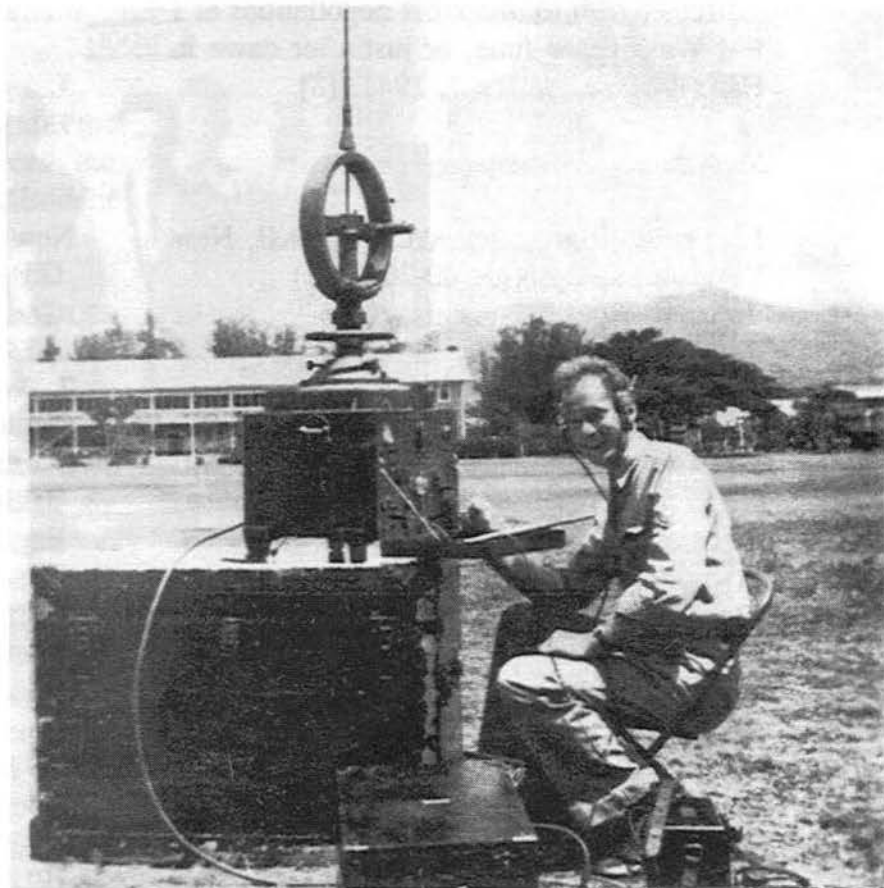
The intercepts for the Army SIS came first from stations at Battery Cove, VA and Fort Monmouth, NJ. Fort Sam Houston, TX and the Presidio at San Francisco came on line by 1938, along with the Canal Zone, Fort Shafter on Oahu and Fort McKinley in the Philippines. The next year, stations in New York harbor at Fort Hancock and Fort Hunt, VA joined the network. [3]. One irregular station appeared in San Francisco about 1931 at the private initiative of Col. Joseph Mauborgne of the Signal Corps, who listened at home (a busman's holiday) and recorded the traffic for Friedman. [8].

The Army in the Philippines monitored the Tokyo and Berlin, and Tokyo and Moscow circuits, while the Presidio and Bainbridge Island listened to traffic on the Tokyo and Washington circuit. [3]. Panama focused on the Rome and Tokyo circuit. [8]. The Army SIS and the Navy equivalent organization "OP-20-G" shared Washington decryption duties in this period immediately before the Second World War.

The Americans and British traded intelligence information on the Japanese. The British in this period had four intercept stations in Australia, plus a Dutch station removed from Indonesia. The Americans provided the Purple Code keys and similar high level material including two Purple Machine Replicas as reconstructed by Friedman. [3].

Counter-espionage work in the ether was the domain of the FBI, but the Coast

A soldier of the 2nd Signal Service Company, the collection arm of SIS, mans a direction finder in Hawaii in 1940.



SIS used this analog of the Japanese PURPLE machine to decipher Japanese diplomatic messages in 1941. The analog was built without any access to the workings of the real Japanese machine.

Guard also made a claim to jurisdiction. [8]. (Eventually, the Federal Communications Commission operated the Radio Intelligence Division under the direction of George Sterling. [14]. Sterling was a leading radio authority and later an F.C.C. Commissioner)

It was the intercept station at Bainbridge that took the communication from Tokyo to the Japanese Ambassador that instructed him to break off negotiations at 1 PM Washington time, or just after dawn in Hawaii on December 7, 1941. [8].

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Irregular S.F. monitor, p. 32
Island intercept stations, p. 232
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Illustrations of U.S. Army stations, etc.,
used by courtesy of Dale Winn of Cloak & Dagger

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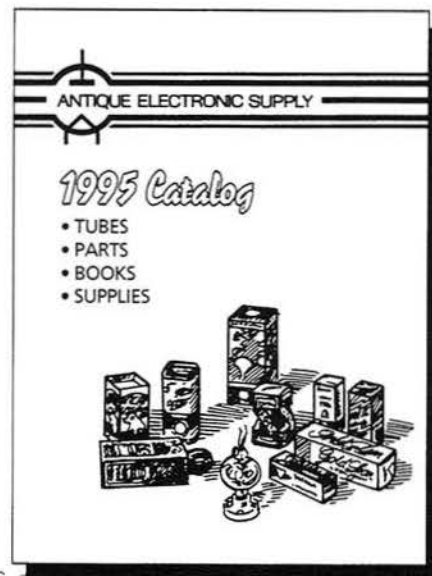
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LETTERS

Editor:

Thanks for the article in the CHRS Journal concerning Radio paper. I am looking for a cardboard Zenith or RCA stand-up signs. I'm also searching for tube cards (see copy). Anyone willing to sell any such material please write. Thanks,

Len Sequeira
2309 Rock St. #16
Mt. View, CA 94043 ##

Editor:

Thanks again for putting out a fine issue of the Journal of the California Historical Radio Society! As a long-distance CHRS member who has still managed to attend the August CHRS meet for the past six years (not this year, I'm sorry to say, however), I thought you might want to consider copying the enclosed article in the next Journal edition as an example of how friendly the press can be to radio collecting. My wife and I appeared in this Washington Post issue (June 30, 1994) that was seen by thousands in the whole Metropolitan Washington area. I and my wife now have to be the most publicly known radio collectors at the moment in Maryland, District of Columbia, and Northern Virginia, as well as some areas beyond that! I received calls from everywhere from persons with radios to sell, fix or get more information on.

Gerry Schneider
31301 Blueford Road
Kensington, MD 20895-2726 ##

//

Editor:

I enjoyed the last CHRS Journal -- one of the better issues.

I was glad to see that someone else likes the Navy RBA, RBB, RBC receivers. When I got mine, some 20 years ago, my collector friends thought I was crazy for getting those "Boat Anchors." How things have changed in the intervening years -- now they only think I am odd!

The radios were cheap enough. I got them at a scrap metal yard in Richmond for the price of the metal in them. Even got the manuals with them. If you need anything xeroxed from them, let me know.

The radios were in excellent condition, my only gripe is that two of them have rackmount cabinets but the third has a table top cabinet.

I am looking for a rack-mount cabinet for my Navy RBC receiver. I will trade table top cabinet or buy.

John Gibson
1075 Sterling Ave.
Berkeley, CA 94708
Phone (510) 849-1051 ##

Editor:

The last membership list was interesting. I found out that there were two members within a block of me. I just sent in my CHRS membership renewal along with a form that requested my interests by numbered groups. Hope those numbers will be on the next membership list.

I did not bother to go to a recent swap meet because it was raining. The

phone hot line could say if the meet would be under cover in case of rain.

Back to the Journal -- on page 23 of the next to last issue there is a mention of a WWII radio homing device. By coincidence, I just received the latest flyer from Fair Radio Sales in Lima and there listed was the same device.

Also I noticed an announcement in a Marin newspaper regarding a Wireless Exhibit in Inverness. I have not seen it myself but plan to when over in that area. I enclose a clipping.

Best wishes,

John Gibson

Editor's note: Ampex meets can be held indoors in case of rain. We will try to make such arrangements for other meets but the facilities are variable. Fair Radio did indeed have the ZB VHF converters in a new old stock box full of accessories. They also sold 1938 aircraft receivers and transmitters N.O.S. As for membership interests, we would like to gather that data again and sort the names by category, so members could determine which other members share their interests. We need someone to make this project a reality. Volunteer to president Dale Sanford. ##

Editor:

... THANKS for the CHRS spring issue -- outstanding! ...

John Bryant
Oklahoma

Editor's note: John is the co-author of the new and quite wonderful book on Zenith Trans Oceanic portable radios, and an

editor, himself, of the *Proceedings* of Fine Tuning (the very best of the Short Wave Listeners' associations). ##

Editor:

Just finished the 20th Anniversary Archive issue of the CHRS Journal and just had to let you know that I think it is terrific! Although I've seen a lot of the restoration hints over the years, it is difficult to find this type of information by digging through past issues of the bulletins and other literature. Having them consolidated in this issue is great, and I'm sure that I will keep my issue handy for future reference.

In fact, I believe the club should consider advertising this issue in the ARC. It certainly made me believe that I have received full return for my annual dues this year.

Thanks to all involved for the effort.

Sincerely,

Jack Gray
1162 Broadmoor Drive.
Napa, CA 94558 ##

Editor:

It was interesting to note that C.H.R.S. President Dale Sanford's favorite radios are 1920's battery sets. I am also collecting these along with some very early AC types. These radios were already obsolete when I was young. In fact, there seem to be more around now than 35 years ago.

Around the fifth grade in school, I started in radio by collecting tubes that radio stores would throw out, sorting and keeping the good ones. While in school, I would

repair radios and TVs then got away from it for over 30 years while working in the computer and semiconductor industries. After being away from radio, now I have gone back to it as a hobby.

I really believe in using #30 tubes were possible and have recently purchased 400 new ones from Antique Electronics. Of course, don't get rid of 01's. They are still needed to keep a radio original and where the bayonet pin is needed. For the person wanting to have an operational radio, the 30's are a good way to go.

While in Florida a couple of weeks ago, I stopped by Radio Relics, 321 East Evans Street, Orlando, FL 32804. The owner is the President of Florida's antique radio club (I didn't catch the proper name). He knew of the Southern California Club but not CHRS. I sent him a copy of your January Newsletter so there might be a response.

Norman R. Leal
1485 Naples Way
Livermore, CA 94550 ##

Editor:

We received the latest CHRS Radio News cassette (Vol.18, No. 1). CHRS is doing a great job in documenting and recording history. Your tape cassettes are placed in the A.W.A. Library. On occasion, portions are used in the A.W.A. shows. Thank you. 73

Bruce Kelly, W2ICE, *Curator*
Antique Wireless Association
Bloomfield, New York

12- Point Reyes Light, November 3,

Wireless exhibit set in Inverness

The mystery of the coastal radio transmitting and receiving stations on the Point Reyes Peninsula will be unraveled in a new exhibit at the Jack Mason Museum in Inverness. There will be an opening reception at the museum on Sunday, Nov. 6, from 2 to 5 p.m.

Ham radio and morse code demonstrations will be offered as well as refreshments.

Titled, "Wireless Pioneers of West Marin," the exhibit explores the

Antique Wireless Association



The Antique Wireless Association, the world's largest organization devoted to the use and preservation of early communication equipment.



Bob (W2ZM) and Bruce (W2ICE) operating the Millen Memorial station at W2AN. Originally designed for 20 meters, it was converted to 75 meter operation in 1994.

background of wireless communications beginning with the experiments of Guglielmo Marconi and others.

Marconi established the first trans-Pacific wireless stations on the West Coast in 1914, with the transmitters at Bolinas and the receivers at Marshall communicating with identical stations in Hawaii, and beyond to the Orient.

In 1920 RCA took over Marconi's operations and expanded the technology and breadth of services. In 1932, AT & T built a receiving site at Point Reyes, and in the 1970s the US Coast Guard established one of the most advanced overseas communications systems in the world. Today these stations serve ships at sea, providing services ranging from telephone



calls to safety and rescue to commercial and government communications.

The Jack Mason Museum is dedicated to the history of the Tomales Bay/Point

Reyes area. It is located in the Inverness Library at 15 Park Ave. in Inverness, and is open during regular library hours.

West Marin's Past

47

by Dewey Livingston

The Zenith

TRANS-OCEANIC

The Royalty of Radios



by: John H. Bryant, AIA and Harold N. Cones, Ph.D.

the radio professors

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RADIO OPERATORS and technicians pose at RCA Communications at Point Reyes in the 1950's. RCA took over Marconi's Marshall (receiving) and Bolinas (transmitting) sites in 1920, and built a new receiving station on the Point in 1930. AT&T followed in 1932, building an overseas voice communication facility. More recently the U.S. Coast Guard established their high-tech station known as CAMSPAC. A new exhibit, "Wireless Pioneers of West Marin" opens with a reception and demonstrations on Sunday from 2 to 5 pm at the Jack Mason Museum in Inverness. In the photo above: Bill Thiele, E. B. Collier, Walt Matthews, Dick Flint, Betty Sutcliffe, Fletch Abadie, Carlton Cherrigan, and Troy Everhart

This, the definitive book on the Trans-Oceanic, was written with access to the Zenith corporate archives and presents a wealth of never-before published photographs, documents and information concerning these fascinating radios, their collection, preservation and restoration.

Why you should buy directly from the authors at "The Radio Professors":

1. You receive a limited, numbered, autographed edition of the book.
2. You receive a "Flea Market Trans-Oceanic Model Identifier" that is not published in the book.
3. Your dollars support further research and writing dealing with Zenith radio.
4. Your name is added to our database of Zenith lovers so that you will receive advance notice of Zenith memorabilia sales and future publications.

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Year	Patents	Designs	Trademarks
1836	1		
1837	110		
1838	516		
1839	1,061		
1840	1,465		
1841	1,923		
1842	2,413		
1843	2,901	1	
1844	3,395	15	
1845	3,873	27	
1846	4,348	44	
1847	4,914	103	
1848	5,409	163	
1849	5,993	209	
1850	6,981	258	
1851	7,865	341	
1852	8,622	431	
1853	9,512	540	
1854	10,358	626	
1855	12,117	683	
1856	14,009	753	
1857	16,324	860	
1858	19,010	973	
1859	22,477	1,075	
1860	26,642	1,183	
1861	31,005	1,366	
1862	34,045	1,508	
1863	37,266	1,703	
1864	41,047	1,879	
1865	45,685	2,018	
1866	51,784	2,239	
1867	60,658	2,533	
1868	72,959	2,858	
1869	85,503	3,301	
1870	98,460	3,810	1
1871	110,617	4,547	122
1872	122,304	5,452	608
1873	134,504	6,336	1,099
1874	146,120	7,083	1,591
1875	158,350	7,969	2,150
1876	171,641	8,884	3,288
1877	185,813	9,686	4,247
1878	198,733	10,385	5,463
1879	211,078	10,975	6,981
1880	223,211	11,567	7,790
1881	236,137	12,082	8,139
1882	251,685	12,647	8,973
1883	269,820	13,508	9,920
1884	291,016	14,528	10,822
1885	310,163	15,678	11,843
1886	333,494	16,451	12,910
1887	355,291	17,046	13,939
1888	375,720	17,995	15,072
1889	395,305	18,830	16,131
1890	418,665	19,553	17,360
1891	443,987	20,439	18,775
1892	466,315	21,275	20,537
1893	488,976	22,092	22,274
1894	511,744	22,397	23,951
1895	531,619	23,922	25,757
1896	552,502	25,037	27,586
1897	574,369	26,482	29,399
1898	596,467	28,113	31,070
1899	616,871	29,916	32,308
1900	640,167	32,055	33,957

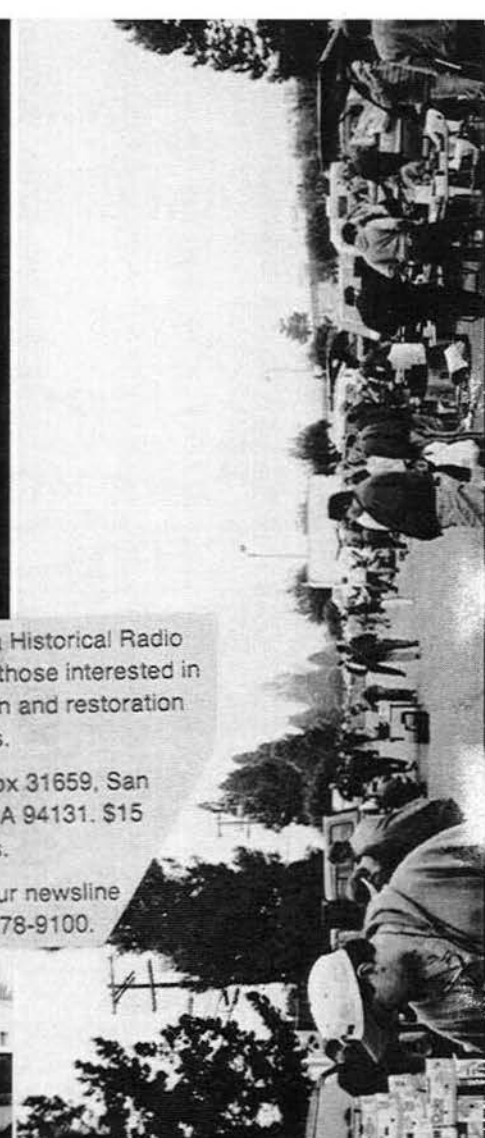
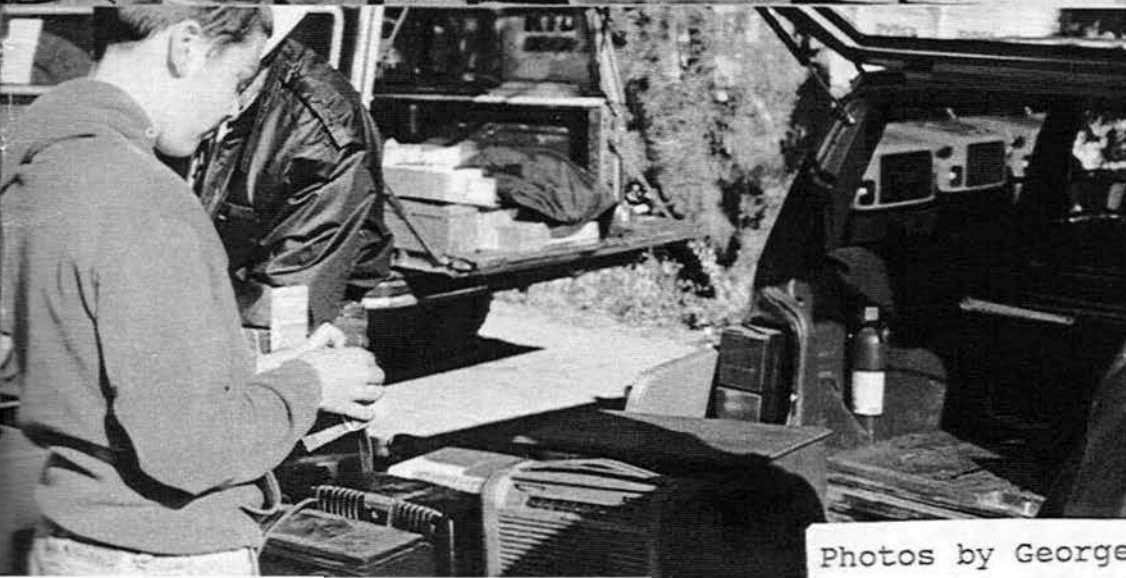
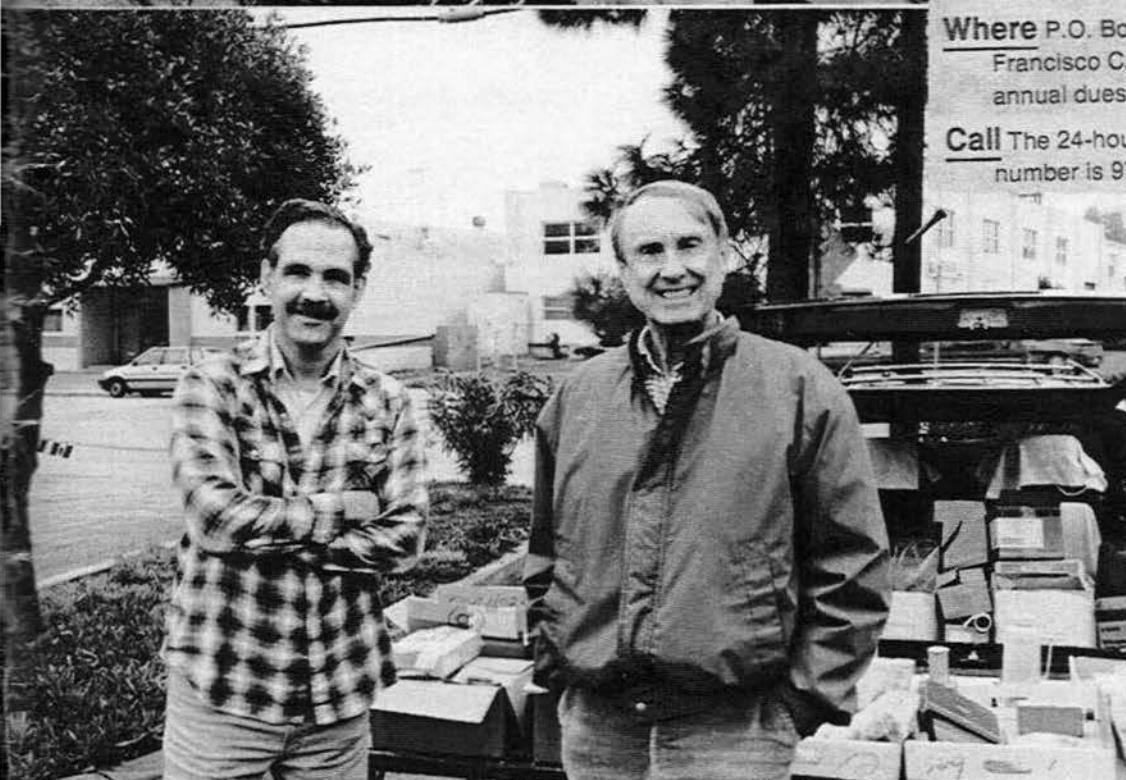
Year	Patents	Designs	Trademarks	Trademarks Act of 1946
1901	664,827	33,813	35,678	
1902	690,385	35,547	37,606	
1903	717,521	36,187	39,612	
1904	748,567	36,723	41,798	
1905	778,834	37,280	43,956	
1906	808,618	37,766	48,446	
1907	839,799	38,391	59,014	
1908	875,679	38,980	66,892	
1909	908,436	39,737	72,083	
1910	945,010	40,424	76,267	
1911	980,178	41,063	80,506	
1912	1,013,095	42,073	84,711	
1913	1,049,326	43,415	89,731	
1914	1,083,267	45,098	94,796	
1915	1,123,212	46,813	101,613	
1916	1,166,419	48,358	107,875	
1917	1,210,389	50,117	114,666	
1918	1,251,458	51,629	120,005	
1919	1,290,027	52,836	124,066	
1920	1,326,899	54,359	128,274	
1921	1,364,063	56,844	138,556	
1922	1,401,948	60,121	150,120	
1923	1,440,362	61,748	163,003	
1924	1,478,996	63,675	177,848	
1925	1,521,590	66,346	193,597	
1926	1,568,040	69,170	207,437	
1927	1,612,790	71,772	222,401	
1928	1,654,521	74,159	236,987	
1929	1,696,897	77,347	251,129	
1930	1,742,181	80,254	265,655	
1931	1,787,424	82,966	278,906	
1932	1,839,190	85,903	290,313	
1933	1,892,663	88,847	299,926	
1934	1,944,449	91,258	309,066	
1935	1,985,878	94,179	320,441	
1936	2,026,510	98,045	331,338	
1937	2,066,309	102,601	342,070	
1938	2,101,004	107,738	353,324	
1939	2,142,080	112,765	363,536	
1940	2,185,170	118,358	374,062	
1941	2,227,418	124,503	384,047	
1942	2,268,540	130,989	392,581	
1943	2,307,007	134,717	399,378	
1944	2,338,081	136,946	404,974	
1945	2,366,154	139,862	411,001	
1946	2,391,856	143,386	418,494	
1947	2,413,675	146,165	426,610	500,001
1948	2,433,824	148,267	435,590	500,002
1949	2,457,797	152,235	441,742	505,324
1950	2,492,944	156,686	443,654	519,384
1951	2,536,016	161,404	444,377	535,490
1952	2,580,379	165,568	444,623	552,624
1953	2,624,016	168,527	444,746	568,680
1954	2,664,562	171,211	444,794	581,249
1955	2,698,431	173,777	444,807	600,188
1956	2,728,913	176,490	444,811	618,396
1957	2,775,762	179,467	639,154	
1958	2,818,567	181,829	656,643	
1959	2,866,973	184,204	671,998	
1960	2,919,443	186,973	690,716	
1961	2,966,831	189,516	709,163	
1962	3,015,103	192,004	725,762	
1963	3,070,801	194,304	742,786	
1964	3,116,487	197,269	762,526	



What California Historical Radio Society, for those interested in the collection and restoration of old radios.

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