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JOURNAL OF THE

CALIFORNIA HISTORICAL RADIO SOCIETY

FOR THE RESTORATION AND PRESERVATION OF EARLY RADIO

CHRS OFFICERS AND STAFF 1996

PRESIDENT/
MAIL PICK-UP
Steve Kushman
4233-25th. St.
San Francisco, CA 94114
415 821-7671

VICE PRESIDENT
Lee Allder
P. O. Box 6785
San Rafael, CA 94903
415 499-9228

SECRETARY
Russ Turner
414 Liberty St.
San Francisco, CA 94114
415 824-8367

TREASURER
Will Jensby
645 Giannini Dr.
Santa Clara, CA 95051
408 296-6071

MEMBERSHIP
SECRETARY
Hal Layer
P. O. Box 27676
San Francisco, CA 94127
415 661-6958

BOARD MEMBER/
PUBLICITY CHAIRMAN
Mike Adams
112 Crescent Court
Scotts Valley, CA 95066
408 439-9544

BOARD CHAIRMAN/
MAILING CHAIRMAN
Dale Sanford
107 St. Thomas Wy.
Tibouron, CA 94920
415 435-6131

ON SITE EVENT
CHAIRMAN
Paul Bourbin
25 Greenview Ct.
San Francisco, CA 94131
415 648-8489

WEBSITE CHAIRMAN
Alan Voorhees
10809 McIntyre St.
Oakland, CA 94605
510 562-3235

MEMBERSHIP
CHAIRMAN
Mike Simpson
21818 Via Regina
Saratoga, CA 95070
408 867-7315

BOARD MEMBER
John Eckland
969A Addison Ave.
Palo Alto, CA 94301
415 323-0101

BOARD MEMBER
John Wentzel
1609 Irving St.
San Francisco, CA 94122
415 731-1920

GENERAL COUNSEL
Bart Lee
88 Kearny St. #1301
San Francisco, CA 94108
415 956-5959

NAME BADGE CHAIRMAN
Norm Lehfeldt
757 Guerreo St.
San Francisco, CA 94110
415 285-0643

TECHNICAL ADVISOR
Larry Clark
438 York Dr.
Benicia, CA 94510
707 745-9132

JOURNAL STAFF:
CONTRIBUTING EDITORS
Bart Lee
Alan Voorhees
Lee Allder

CONTRIBUTORS
Stan Lopes
Bart Lee
Alan Voorhees
Norm Leal
Norm Cox
Lane Upton
Dan Smith
Martin Love

NORTH VALLEY CHAPTER
Norm Braithwaite
P. O. Box 2443
Redding, CA 96099
916 246-4209

ABOUT CHRS

The California Historical Radio Society (CHRS) is a non-profit coporation 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 and furnished free of charge to members. Yearly membership dues are $20 (U.S. funds).

Submissions for the *Journal* are always welcome. Typed copy is prefered, submitted on a 3.5 inch IBM or Macintosh diskettes in ASCII or Microsoft Word format. Send all material to Alan Voorhees and include your name, address, and phone number. You write about radio and we'll print it.

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CHRS
P.O. Box 31659
San Francisco, CA 94131
415 978-9100 thru Aug. 31
415 821-9800 after Sept. 1

CHRS on the Internet:
http://www.wp.com/chrs

ON THE COVER

Sets manufactured by International Radio Corporation, Ann Arbor, Michigan.

(Left to right)
Front cover: Kadette "Classic" (1936), Kadette Model 72 (1936), Kadette "Jewel" (1935).

Back cover: Kadette "Modern Clockette" (1937), Kadette Jr. (1932).

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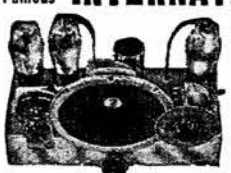

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6.75

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NEWS AND INFORMATION...FROM THE PRESIDENT

Steve Kushman

NEWS:

NEW OFFICERS—There was a Board of Directors meeting after the San Francisco meet in July. At this meeting, **Lee Allder,** was officially elected to the position of Vice President. Also, our past President, **Dale Sanford,** was elected to the position of Chairman of the Board of Directors, and President Emeritus. **Lee** brings new ideas and enthusiasm and **Dale** brings years of experience. Let's welcome them to these positions and offer our congratulations! And many thanks go to past Chairman **Bart Lee** for his great work on the Board. Please read **Russ Turner's** report on this Board meeting for more details.

DUES—The Board of Directors, voted to raise membership dues to $20 a year due to increased costs of running the Club. 3 year memberships will be raised to $55 and lifetime memberships will be $250. This new fee structure will be in effect beginning in 1997 and our forthcoming renewal forms will reflect these changes.

HOTLINE—Starting September 1st. the **CHRS HOTLINE** number will change in order to serve you better. The new **HOTLINE** number is **415 821-9800.** In the future you will be able to fax the **HOTLINE.** Remember the new number, **415 821-9800.**

TECHNICAL SERVICE—**Larry Clark,** our Technical Advisor, reports he is ready to begin the CHRS Technical Reprint Service. Here's how it works. If **members** need radio information or schematics, from our library, send a Self Addressed Stamped Envelope along with $1 to: **Larry Clark**
438 York Dr.
Benicia, CA 94510

Larry will make copies of whatever you need and send them to you. It's that simple! Thanks **Larry!** Also thanks to **Stefan Ponek** for helping out on this project!

Also, BIG Thanks are due to the following members who donated Riders and related materials to our library:

Stan Lipski
Walte Wiebe
Mike Brazil
Steven Bohte

Your generous contributions are greatly appreciated! The library is still looking for the following Riders manuals: Vols. 1, 2 ,4, 5 and 17 thru 23. If you have these and aren't using them, the Club's library certainly could!

JOURNAL—As some of you might already know, **Bart Lee,** our outstanding Journal editor, will be stepping down from this position. **Bart** is responsible for making the CHRS Journal the finest publication of its kind! The editor's duties will now be handled by **Alan Voorhees,** with help from **Lee Allder.** I'm confident that this new team will maintain and improve the high quality standards we've set in our Journal. If you would like to become part of our new Journal staff, let us know. Once again, our deepest gratitude goes to **Bart Lee,** for all his tireless effort on our Journals! We would like to credit **Dan Smith,** for his article in the last Journal on reviving a Hallicrafter's S-38C.

ROSTERS—Please check your new 1996 Rosters and make sure your information is correct. If it isn't, drop us a line and it will be corrected in the membership computer, by our membership secretary **Hal Layer.** The new Roster seems quite large because, the Board of Directors voted to include members who are no longer current. So, people listed in the Roster with an asterisk (*), after the name, are **not** current members and have been included for your information.

NAME BADGES—**Norm Lehfeldt,** our badge chairman is in the process of redesigning the permanent plastic badges we have offered. To those of you we owe badges, please accept our apology and be patient a little longer. In addition to the plastic badges, **Norm** will continue to provide the handsome 3 color paper badges that we debuted at Foothill, August 3rd. If you want changes or additions made on these badges, drop us a note. Those of you with longer names, the problem of losing letters at the beginning and end, will be corrected next time. Thanks, **Norm,** now we don' t have to say, "I've seen and talked to you for years, but don't know your name."

WEBSITE—Our URL has changed, for the better, (it's much shorter!). The new URL is **http://www.wp.com/chrs**. The site has had over 2500 visitors and improves constantly. Thanks again to **Alan Voorhees,** who continues to do an outstanding job of maintaining the Site!

INFORMATION:

COLLECTOR EVENTS:

September 14th, Saturday, 8am... Western Railroad Museum, State Route 12, between Fairfield and Rio Vista, CA. This is an event for the whole family. Because, after we finish examining, handling, and exchanging old radios, its Picnic Time! There will be a large grill, hot and ready to cook on. There will be a special tour of the museum. There are exhibits and a bookstore. And, If that's not enough, there is a large collection of full sized, vintage railroad equipment, much of it in operating condition. We will be able to ride on some great old electric streetcars or trains. Bring your wind up phonos or battery radios for nostalgic entertainment during the picnic. For this event, there will be NO CHRS sellers fee. Please pay the Special Reduced Museum admission fee of $5 per person. There is a special childs rate for children between three and fifteen. Children under three admitted free.

Here are some directions: From Interstate 80, take the State Rt. 12, Rio Vista exit at Fairfield. Stay on Rt. 12 through Suisun City past Travis AFB. The road then turns sharply right at Denverton and starts to go up and down over small hills. As you come down of the THIRD hill, (which is actually a railroad overpass), look for the Museum directly on your right. If you are near Highway 99 or Interstate 5, take State Rt. 12 at Lodi and proceed to the museum via Rio Vista. When you see the Museum, turn left, before the overpass. A map can be found on the map page of this Journal or can be downloaded from our Web site.

Thanks to **Paul Bourbin** and the Bay Area Electric Railroad Association for hosting this

continued on next page

IN MEMORIAM

Henry "Hank" Dexter Olson died at home March 9th at the age of 64. Hank worked for SRI for 27 years as a radio physicist/research engineer. Some of the organizations he was involved with include: Institute of Radio Engineers, American Radio Relay League, Stanford Amateur Radio Club and the Society of Wireless Pioneers. In 1995 he was the recipient of the Charles D. "Doc" Herrlod Award for outstanding achievement in the preservation and documentation of early Radio.

event.

I'd like to extend a special invitation to our friends in the Sacramento Historical Radio Society. This will be a lot of fun, and we look forward to your attendance.

October 5th, Saturday, 8am...Redding, CA...Highlander Dental Supply, 3035 Crossroads Dr. This popular annual event is hosted by **Norm Braithwaite** and the North Valley Chapter. If you need more info call **Norm** at 916 246-4209. There should be some interesting radios at this event. A map available on the map page or on the Website. Seller's fee applies.

October 19th, Saturday, 8am...Merced, CA...13th and X Sts. New and enthusiastic member, **Cliff Berthelsen,** has offered to host this event at his business in Merced. There is great intrest in radio collecting in the Merced/ Fresno area and this would be a good opportunity to meet those collectors who are not yet members. Since this our first event in this area, who knows what kind of radios we'll see! Call the Hotline for more info. Map available on the map page or on the Website. Seller's fee applies. Thanks **Cliff!**

November 2nd, Saturday, 8am...Foothill College, lot "T", Los Altos Hill, CA. Take the El Monte Road Exit west from Interstate 280. Turn right into the campus. At the "T" of the outer campus road, turn left (look for the sign), and follow the road up to lot "T". This will be our last event at Foothill for the year. All of our events there this year have been quite successful. Thanks to Foothill College and **Gloria Schar,** who has been very helpful. Seller's fee applies.

December ???, There is nothing scheduled for this month, but we're open to suggestions for an event. Got something in mind? Give me a call.

As always, I'm available to answer any questions or hear any comments from Club members. If you have comments or suggestions. call me at 415 821-7671.

Warmest Regards!

Steve

CHRS WELCOMES NEW MEMBERS!

An organization such as CHRS needs and welcomes new members. New members bring new ideas and enthusiasm and keep the club interesting and fresh. We thank these collectors have joined since Dec. 1995 for their support. Some familiar names are former members who have rejoined us this year.

Alfred Wirtenberg - Weston, CT
Jon M. Bevilacqua - Jamaica Estates, NY
Steve Cabella - San Anselmo, CA
James P. Romauld - Brooklyn Park, MN
Dan M. King - Gilroy, CA
Ludwell Sibley - Flemington, NJ
Evan J. Powell - Lakewood, CA
John & Gail Ralls - Windsor, CA
Bill Sinn - South San Francisco, CA
Richard Giambastiani - San Rafael, CA
Isaac M. Kikiwada - Muontain View, CA
C. R. Brello - South San Francisco, CA
James E. O'Neal - Alexandria, VA
Walt Wiebe W6RKJ - San Leandro, CA
Larry N. Smith - Roswell, GA
Gerald S. Cromer - Cayce, SC
Tom Grisell - Palo Alto, CA
Sarah Wanamaker - Rohnert Park, CA
Daniel Zocchi - Petaluma, CA
Stephen Duffert - Concord, CA
Noel P. Thompson - Menlo Park, CA
Leslie Zwiebel - Menlo Park, CA
Donald Cochrane - South San Francisco, CA
Roger Hill - San Bruno, CA
George A. Armanini - Mountain View, CA
Lee Allder - San Rafael, CA
Ray Morrow KB6MM - San Jose, CA
Marty Wise - Castro Valley, CA
Ron Roberts - Los Banos, CA
Kevin Harlow - Turlock, CA
Mark James - Oakland, CA
Don D. Nichols - San Jose, CA
Don Casino - Danville, CA
Dave Rinehart - Reno, NV
Jerry R. Evans - Mill Valley
Curt Brohard - Alameda, CA
Jim Farley KMKX-FM - Brookville, PA
Peter F. Warncke - Vallejo, CA
Eugene K. Warner - Ridgecrest, CA
Gustav & Sandra Schier - Castro Valley, CA
Jim Carrington - San Francisco, CA
Scott Dickson - San Ramon, CA
Vince Dileo - Oakland, CA
Rick Botti - Fremont, CA
Robert E. Duesterhoeft - San Carlos, CA
Carl R. Huboi - Los Gatos, CA
Anthony M. Migliore - San Francisco, CA
Eddie Enriquez - Modesto, CA
Bob Baker - Redding, CA
Jeff Hollinger - Oakland, CA
Richard Majestic - San Jose, CA
Marc Gottlieb - South San Francisco, CA
Joseph Pinner KC5IJD - Lafayette, LA
Paul L. Wiegman - Estherville, IA
John C. Corradini - Williams, CA
Fred Gurzi - Los Altos, CA
Robert L. Larson W7LNG - Medford, OR
George Read - Kihei, Maui, HI
R. G. Policarpio - Daly City, CA
Wesley R. Cobb - Laguna Hills, CA
Ishan Bhawnani - Windsor, CA
Clifford Pasos - Santa Clara, CA
Bob Rammel - Sacramento, CA
Bill Groves - Sunnyvale, CA
Terry L. Ziesman - Cypress, CA
Andrew Lucas - Lincoln, CA
Chris Rogers - Pakenham, Australia
Tom Harrison - Sunnyvale, CA
Edwin Fiske Francis - San Francisco,CA
Ed Zeranski - San Diego, CA
Tom Jackson - Pacifica, CA
Joseph Feng - San Jose, CA
Andrew Logar - Santa Rosa, CA
Charles Lindquist - Grass Valley, CA
Steve Pazar WA4DUT - Santa Rosa, CA
Larry A. Murch - Concord, CA
Alan Eaton - Lincoln, CA
Pete Griffin - Penngrove, CA
Hugo Castelli - Joliet, IL
Jerry Wiley - Petaluma, CA
Alexander Seddio KB6IDO - San Francisco, CA
Bob Pawley - Santa Rosa, CA
Hector Bran - Walnut, CA
Donald L. Seneker - Mt. Vernon, MO
Cliff G. Berthelsen - Merced, CA
John D. King WD6FEQ - Santa Rosa, CA
Sheldon Donig Museum - San Anselmo, CA
Bill Irwin K6JCZ - Meadow Vista, CA
Joe Knight - San Pedro, CA
Lee Stanford - Fremont, CA
Daniel Buchalter - San Leandro, CA
Gary Halverson - WA9MZU - San Jose, CA
Dave Mitchell - Riverside, CA
William Howell- Carmichael, CA
Jack E. Haslup - Scottsdale, AZ
Alan Rousseau - Fremont, CA
Steve Casper - Benicia, CA
Ralph Day - Moraga, CA
Mark Drury - Pleasanton, CA
Ken Martin - Auburn, CA

CHRS BOARD MEETING JULY 6, 1996

Russ Turner

Some members asked about starting Swaps earlier due to Daylight time. Vote was a unanimus NO! (maybe 9 am). Paul Bourbin was presented with an Official Badge to flash at Swaps to show his authority. Swaps should be on the first Saturdays to avoid conflict with the Ham Meets at Foothill.

The Financial Statement was presented and showed we have about $3000 in the bank. We have sold a lot of 3-year memberships, so some of that represents a credit. Life Memberships are now available at $225, and should be adertised in the Journal. Next year the dues will be raised to $20 to reflect increased costs.

Should we have open nominations for Board members, or should we be Self-perpetuating? Discussion of how to get members to nominate or volunteer for Board seats — great apathy shown. MSP recommend that the Board fill vacancies, with a 3-year limit. The VP will be appointed by the Board. The Ex-President will move to President Emeritus. Lee Allder is now VP. Congratulations!

Its now time for a new membership Roster, which will be in a line-by-line format for ease of use. Should it contain current members only or all past and present members? MSP current and past member to make a complete data base. New members should be acknowledged in the Journal. The audio tape project is now on hold. we have some material on hand, such as an interview with an old AWA member. It is rather like an oral history archive. Maybe the tapes should be sold for $2 to interested members and advertised in the Journal. The "Hints and Kinks" section needs to be slimmed down and possibly indexed. Alan Voorhees volunteered for that chore. Bulk mailing to reduce costs came around again, and should be enabled in time for next mailing and renewed on a annual basis.

Name Tags discussed —getting people to wear them. Permanent ones tend to be forgotten, so would paper ones issued at each Swap be better? Norm Lehfeldt assigned to this committee.

Hot Line should be listed in White Pages under CHRS. Can Pres please have a Club-paid phone in his house? MSP

Other Chapters. Bob Rammel in Sacramento says that group is fading out and may like to associate with us. Cliff Berthelsen in Merced has 20 or 30 guys interested in becoming a Chapter. If implemented, should these groups have seats on the Board? It would be to our advantage to expand our Swap areas. (Possible Swap in Merced in October) We should invite them. MSP

Library now located at Larry Clark's, moved from Bart Lee's. Bart is now slowing down from Club activities. Dale Sanford was made Chairman of Board. The Library may need some Riders to make our collection complete. Any missing volumes should be sought thru ads in the Journal.

Perham Foundation discussed. May be final resting place for our library when they get building built. Bart will see that we keep represented in their affairs. Also a radio station may get going in the new Presidio one of these days. There is a building and some equipment including an antenna farm that the Park Service would like to preserve as a piece of Radio History. The Boy Scouts may get involved also. Anyone for a Merit Badge in re-capping?

Speaking of badges, Paul Bourbin was presented with an official looking, (it has the State Seal on it!) metal badge, for use in his capacity of On-Site Swap Meet Chairman. "Don't set up tables before 8am, he's got a Badge!" We adjourned after a nice lunch.

WANT ADS

WANTED:
Televisions, Philco Predictas, all models. All types of earlier TVs wanted. Send or fax description to Sheldon Donig, 340 Laurel Ave. San Anselmo, CA 94960 415 454-8851 Fax 415 456-9322.

Riders manuals, Volumes 1, 2, 4, 5 and 17 thru 23. Call CHRS HOTLINE, 415 821-9800.

Blue, etched, side mirror for Sparton 558 (4 knob). Dial glass for Sentinel 248 (wavy grille). Chassis for Stewart Warner R469. Steve Kushman, 4233-25th. St. San Francisco, CA 94114. 415 821-7671.

2 dud WD-11 tubes. Alan Voorhees, 10809 McIntyre St., Oakland, CA 94605. 510 562-3235.

FOR SALE:
100+ battery and early AC sets from the 1920's (no tubes) for
sale cheap! ($20-$50) Call for appointment to preview. Norman Braithwaite, P.O. Box 992443, Redding CA 96099-2443 (916)246-4209, (916) 245-0864

CHRS Tee shirts, $17, including postage. CHRS baseball caps $10, including postage. Call CHRS HOTLINE, 415-821-9800.

SERVICES & MISC.:
A limited supply of replacement parts I can provide to radio collectors of your club. Robert m. Urban , 55 hawthorne Ave. , Los Altos CA 94022

Repair of tube type radios, especially auto radios. Roy Yost, 30 Clinton Street, Redwood City Ca 94062

Wind up phono repair service
(916) 589-0138. Allan Hibsch, 4 La Foret Court, Oroville Ca 95966

Military literature, parts+ supply + books Steven Braley , 1402 Prospect Way, Suisun City Ca 94585

Vacuum Tube Valley Magazine. Quarterly Magazine on Audio and tube technology—Modern + Vintage. Charles Kittleson, 1944 Oak Knoll Drive, Belmont CA 94002

THOUGHTS OF CHAIRMAN *EMERITUS* BART

Bart Lee, xWPE2DLT
327 Filbert Steps, San Francisco, CA 94133
415 956-5959

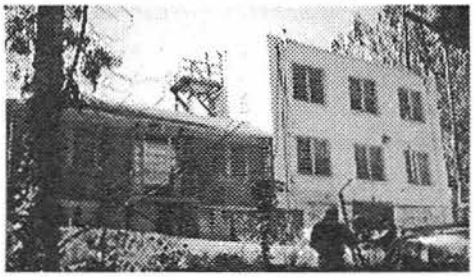
HANK OLSON, R.I.P.

We have lost **Hank Olson**, who died March 9. Both this *Journal* and the AWA *Old Timers' Bulletin* featured articles of his this Spring. He may not have known that CHRS awarded him the Herrold Award, as announced in the last *Journal.* Hank Olson was a wonderful historian, thorough and enthusiastic. Hank's writing informed and entertained. Hank's friendship I recall with a warm glow. We will miss him, as will all of his many associates from his distinguished careers, only the last of which was amateur historian.

THE PRESIDIO — RADIO PROJECT

The Presidio is the home of several historic radio facilities. The National Park Service, which administers the Presidio as part of the Golden Gate National Recreation Area, is looking for groups to save worthwhile buildings at the Presidio. The matter is complicated by the pendency of the Presidio Trust legislation in Congress. Presently, only temporary permits are available for use of facilities.

What relates to radio is the Army station WVY main building, its transmitter site. This building is rehabbed already and is the base housing office. It is big enough for a major museum. Of similar interest is the main antenna farm and its Coastal Artillery radio



station building in its center. This building is in pretty good shape, as are the 100' antenna masts. This site would make a great operating site for vintage equipment, field days, Boy Scout On-the-Air Jamborees and perhaps the remotely operated old Collins gear now at Bolinas but in need of a new home. Also fairly well preserved is the first WVY site, a circa 1922 building with a tall metal tower. This was first WUO as a spark wireless, perhaps as early as 1910, then WVY, and also the first Army Amateur Radio Service station circa 1926, and a broadcast station, logged in about 1922 as station AGI (earlier perhaps it used the call letters PS). This first WVY site soon had an adjoining building, very likely the site of "Station 2" of the "Second Signal Service Company," which was the West Coast intercept operation feeding short wave Japanese traffic to the Washington codebreakers. Later this building became the MARS (Military Affiliate Radio Service) facility, in use until recently. To the East at Crissy Field, the aeronautical radio station building still stands, converted to a residence.

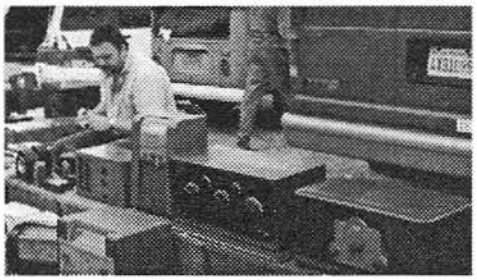
My article in this issue: *The Radio Spy in the Presidio* tells a tiny bit of the fascinating radio history of this very important military and cultural history site, the Presidio of San Francisco.

Opportunities abound here, but we need all the help we can get. **Henry Engstrom** has been instrumental in making the connections to the Presidio Historian **Steve Haller** and the Presidio Curator of Military History **John Martini. Will Jensby** and **George Durfey** and I have helped survey the sites and provided requested information to the historians. The **Perham Foundation**, and its President **Don Koijane**, are supportive and may help a rehab effort. We need one or more project managers and volunteer staff. We can put in the long hoped-for CHRS Museum. We can put in vintage and working radio gear. We can research, write-up and publish related history articles. We can play with the old radios of the era. We will have to put in lots of sweat equity, though, to get the sites up to standards. Call me if you can help in any possible way:

SWAPMEETS

Several of us got down to San Luis Obispo in May, and a fine time was had by all. The joint swapmeet with SCARS was very successful.

The Military Radio Restoration Group parlayed the joint event into their first meeting as well, also very successful. **Tom Horsfall** and **Henry Engstrom** are moving forces in this association. Tom, Henry and **Alex Seddio** also operate on the Military Radio Collectors [Amateur Radio] Net, every Saturday morning at 8 am. During and after the Marin Swapmeet on June 8, they took the



high ground at Hawk Hill (Hill 129) in the Marin Headlands. See nearby photo. With old time antennas and old time military radios, they got out as far as the Sierras. It was a blast turning the hand crank generator on the WWII SCR-284: it was real "push-to-talk" — no push, no talk! When the operator did engage the mic and put out a modulated carrier, it got harder to turn the crank generator, thanks to magnetic resistance for the armature as the set drew current.

The Marin swapmeet at **Erik's Downtown Drive-In** on Lindaro Street in San Raphael was also a great success. Patronize Erik's Drive-In!

We should publicize in local papers and on the radio such regional (and regular) meets.

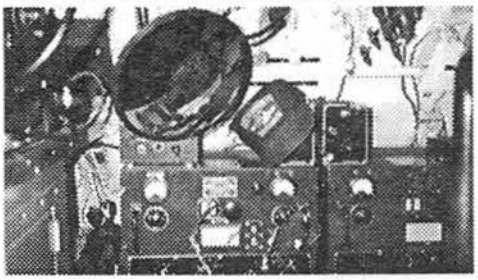
Who will take on this task? Remember, publicity about swapmeets brings out new old radios!

Speaking of swapmeets, the Granddaddy of all old radio swapmeets is at the annual **Antique Wireless Association** convention in Rochester New York each September. A photo nearby shows about one sixth (⅙!) of the meet.

There's great stuff there and great paper and best of all, great people. The trip to AWA is well worth it. This year's convention is the first week in September — make it if you can. If you get there by Wednesday afternoon, you can enjoy my presentation on radio interception for intelligence purposes from 1903 to 1941.

USS POMPANITO NEEDS GEAR

The *USS Pompanito* is the fully restored WWII submarine at Pier 45 in San Francisco. The radio room (see nearby photo) is almost fully restored, but in need of the short wave receiver



used then, the Scott RBH-2. Has anyone got one? They also need some IFF and RADAR gear, and a SIGABA encryption machine. See nearby letter and photos. It was great fun visiting the radio room, and the radio room crew will be happy, for CHRS members, to add this special leg to a standard tour if you call in advance to schedule it.

MARCONI AT THE EXPLORATORIUM

A truly world class collection of wireless and radio gear appeared at the Exploratorium last November, with hardly any publicity. Italian Signal Corps **General B.r.o. Francesco Cremona** brought over hundreds of impressive pieces. His brochure is nearby. Several CHRS members did enjoy the exhibition. General Cremona is looking for a qualified buyer for the whole collection: anyone interested? Give me a call: 415 956-5959.

HAIL TO THE NEW CHAIRMAN!

Dale Sanford has ascended to the Chairmanship of the Board of Directors of CHRS. We all owe Dale a vote of thanks for his good service as president preceding **Steve Kushman**, and now we are in Dale's debt for taking on the Chairmanship as well. **Lee Allder** has taken on the vice-presidency and presidency-in-waiting job and is helping with the *Journal* (as is **Alan Voorhees**). Steve is doing such a great job he will be a hard act to follow. We have such a good club because of all the hard work done by these folks and by all of our committee chairmen. Just getting the library into the hands of our Technical Advisor (and now Librarian) **Larry Clark** was a relief and we are grateful to Larry for taking on this big job. Thanks also to **Norm Lehfeldt, Alan Voorhees, Steve Kushman, Norm Cox, Dale Sanford, Stefan Ponek, Rich Ortega**, at both ends, for their help in the move out of my basement. (By the way we still need some early Riders, e.g., 1, 2, 4, 5, 17-23 and Index 11-23— give Larry a call if you can make a donation. Many thanks to **Mike Brazil** of San Luis Obispo for donating some Riders.)

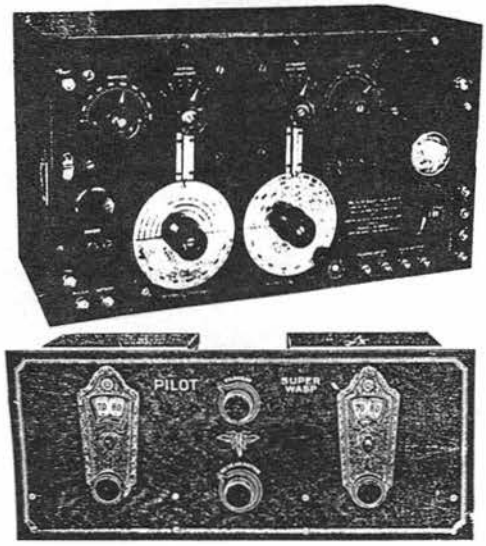
If you would like to serve on the Board of Directors for the good of this Society, give Dale or Steve a call. There are also many tasks done by many members and function chairmen, such as arranging swapmeets, editing and publishing the *Journal* and the like. If you can help out, or have a new idea, call Steve Kushman.

THANKS, CHAIRMAN *EMERITUS* AND NOW *CONSTABLE* PAUL BOURBIN

I joined CHRS ten years ago, and I treasure all of the friends and acquaintances I have made in the old radio hobby. The camaraderie of CHRS (and AWA) feels real good, in a sometimes all too harsh world of corporations, governments and strangers. As I step back from active administrative involvement, I see clearly how much good work is done by so many good men to make this club what it is. I am especially sure of how much we all owe **Paul Bourbin** for saving this club 10 years ago and for all of his work as President and *Journal* editor. Paul has also selflessly taken on the usually thankless task of keeping order in the initial moments of the swapmeets, guiding vendors in no sooner than 8 am, collecting fees and generally acting as the Law West of the Pecos River in those early morning hours. It was therefore my supreme pleasure, as my last official act as Chairman of CHRS, to procure a *real* Constable's badge for Paul, which the President and Board presented to him at the last Board meeting, July 6. **Thank you Paul for all your good work!**

THE RADIO SPY IN THE PRESIDIO

Bartholomew Lee



SHANGHAI 12 October 1928

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War clouds from the Far East scutted from Japan in the 1930s. The Japanese Militarists had already started to create their "Greater Asia Co-Prosperity Sphere." The Rape of Nanking sobered America, following the Japanese seizure of Manchuria in 1931, but America focused largely on Europe, where the German Nazis took the Ruhr Valley, then Czechoslovakia. The U.S. Navy watched and listened to Japan, as early as 1927, from Shanghai[11] in an intercept post manned by U.S. Marines and sailors. A few far-sighted officers in the U.S. Army Signal Corps also looked (and listened) to the Far East.* This note is about one of them, Joseph O. Mauborgne (1881-1971), early and late photos of whom appear nearby.[2,13]

Then Colonel Mauborgne of the Signal Corps lived and worked in the oldest Army base in the country, the Presidio of San Francisco, in 1931. The Presidio had been founded by the Spanish in 1776, and taken over in the Mexican War of 1845-46. The Signal Corps was, of course, responsible for Army communications. It was Mauborgne who, as a Major in 1921 and the Chief of the Signal Corps Engineering and Development Division, had signed-off on the general design for the standardized Army building to be used as radio reception stations. Mauborgne's approving signature appears on the plans for Building #312, the first Presidio radio station WVY, preserved in the Presidio Military Archives [1].

The Army in the early 1930s did not yet have any program of listening to the radio transmissions of the Japanese, although it established its first official if experimental intercept station in Washington, D.C., best suited to interceptions of European communications, in 1931. [11] The Army had a small cryptography unit, the Signal Intelligence Service, under the supervision of William F. Friedman. [8] The Signal Intelligence Service of the Signal Corps pretended to engage only in training. [7] A few years earlier, in 1929, Secretary of War Henry L. Stimson had shut down the Army's first cryptography unit, MI-8 of the Military Intelligence Division of the General Staff (G-2). This was the so-called "Black Chamber" of Herbert O. Yardley. [7,8] Secretary Simpson later explained that "Gentlemen do not read each others' mail." The Army activated the Signal Intelligence Service in the Signal Corps upon the demise of the Black Chamber in Military Intelligence. [8]

"Reading the mail" later became a euphemism for monitoring radio transmissions, particularly radio-teletype. In the 1930s, however, considerable care had to be exercised by anyone who might want to listen to radio transmissions, almost all of which were in Morse code, because such interception was widely regarded as illegal (under the federal Wireless Law of 1912), and certainly immoral. This applied even to encrypted traffic from other and possibly belligerent nations. Army brass came to employ a "training-only" rationale to circumvent what they took to be the explicit constraints of the 1934 federal law known as the Communications Act. [7] The Act by its §605 (still in effect) was widely held to criminalize interception and disclosure of radio transmissions not meant for broadcast. In 1931, the example that had been made two years prior of Col. Yardley under the 1912 Act could not have been far out of mind. The Act had provided:

"No person ... shall divulge the contents of any messages transmitted by such [a radio or wireless] station... unless legally required to do so by the court ... or ... competent authority." [11]

The targeted messages were encrypted. An example of a hard copy record of one such intercept, from the Navy Shanghai intercept station in 1928, appears nearby. [5] The Army could always argue that interception and recording of an *encypted* message did not divulge its contents. Discretion was nonetheless appropriate.

Col. Mauborgne had official duties at the Presidio, and, presumably, a nice home on a hill up in "officer country." He had performed his duties admirably in France in World War One at the rank of Lieutenant Colonel. He was one of only 17 Signal Corps officers to receive the Distinguished Service Medal. [14] It was from his home, however, that he became in 1931 the ears of the Army on the West Coast.[11] He knew full well the value of interceptions for intelligence, for he had himself devised the mechanical encryption system used by the Signal Corps to frustrate interceptions and decryption in World War One, [14] during which he had commanded

the Land Division Engineering Section of the Corps, which included all radio units. [14] His system was in essence the unbreakable "one time pad" although it was electro-mechanical.

Col. Mauborgne's monitoring station in 1931 may have employed a military receiver or amateur radio equipment. The Hammerlund Company had just brought out its Comet superheterodyne communications receiver, which was state of the art. The most popular amateur receiver of the day was, however, a regenerative circuit, the Pilot Company's Super-Wasp. (Illustrations appear nearby [3,10]). The Presidio's WVY receiving station as of 1922 utilized AMRAD IP-501/SE-1420 receivers, also a regenerative circuit. A photo of that station appears nearby, [12] along with an illustration of that receiver. [9] These radios were also in use at this time at the Marconi receiving station a few miles North at Marshall, the call letters of the transmitters of which were KPH. [6]

Listening to Japanese diplomatic point-to-point transmissions had to be a challenge. Yet if the Japanese Embassy in Washington, D.C. could hear the signals, so could a dedicated monitor in the Presidio. San Francisco was, after all, one ionospheric skip short of Washington, the gods of propagation being willing.

From his short wave radio listening post in the basement of his home, Col. Mauborgne monitored and recorded radio transmissions from Tokyo. Col. Mauborgne apparently was not one to let a little thing like Yardley's disgrace or Congressional enactments get in the way of winning a war. The Japanese, like all other nations, then communicated with their diplomatic corps by radio as well as by cable. All messages were encrypted to frustrate monitors, such as, no doubt, American officers with time on their hands. Col. Mauborgne, however, and in his spare time as it were, worked in partnership with cryptographer William Friedman. The Colonel's recordings went (presumably by military courier and perhaps by air from the Presidio's Crissy Field) to the Signal Intelligence Service in Washington, D.C. There Friedman and his small but brilliant staff worked them over, looking for clues to the code. Inasmuch as Col. Mauborgne used an automatic recording system, his cannot have been entirely amateur effort by the man who just happened to be the nation's foremost cryptographer.

The Japanese named their codes by letter, but the American cryptanalysts denominated them by color for security reasons. [11] In 1940, in an unparalleled feat of mind, Friedman broke the Japanese Purple Code. Col. Mauborgne's recorded materials provided some of the earliest grist for the codebreakers' mills. Thereafter, the Army and Navy both established chains of radio intercept stations around the world well before Pearl Harbor; the Army at then General Mauborgne's initiative. There was soon an enormous amount of material to work with. With Friedman's penetration of the Purple Code, the Navy took the advantage in the Pacific after Pearl Harbor. Even the Pearl Harbor attack had been predicted as a result of breaking the Purple Code, but the message from Washington to Hawaii (via radio station WVY at the Presidio) was delayed in transit too late to be of warning.

Col. Mauborgne went on to the rank of Major General. He commanded the entire Signal Corps from 1937 to 1941. [13] A photo appears nearby from this period. He was instrumental in the development of RADAR by the Signal Corps. [4] As sensitive as he was to interception and decryption, he took the lead in establishing the American Army intercept corps, called the Second Signal Service Company, activated on January 1, 1939. He knew the work was hard, and secret, and that the operators deserved premium pay, prestige and perquisites (and that in the absence of sufficient recognition, a peacetime Army could not keep them). [15] His formation of this corps was the foundation for the Army's intercept work in the Second World War, and the post-war formation of the Central Security Service and the National Security Agency for interception and decryption of communications intelligence.

General Mauborgne wrote noted training materials for the Army on cryptology in and after 1914 when he broke the British Playfair Cypher, and a 1914 book on the use of the wavemeter in wireless. He also invented numerous radio-related devices. He was from 1914 a member of the Institute of Radio Engineers and the recipient of the 1941 Marconi Memorial Medal of Service from the Veteran Wireless Operators Association. He had been an artist as a young man in the Art Students' League at the turn of the century, and was a noted painter of portraits in later life. He continued to study art at the Chicago Art Institute and the Corcoran Art Gallery, while in the Army in the 1920s, before he went to the Army War College in 1931-'32. His overseas military service included Panama and the Philippine Islands as well as France. He undoubtedly spoke several languages. He was a frequent delegate to international radio conferences between the Wars. After World War Two, he turned to making violins, winning two international prizes. He had married in 1907, and raised two children. He lived to the ripe old age of 90. [16]

General Mauborgne was not only a good spy, he was a renaissance man: Army General, mathematician, artist and musician. It was the British experience in the Second World War that musicians, artists and even literary types made excellent cryptologists. Perhaps their minds were quicker or more open to possibilities. The Spy in the Presidio was certainly an exemplar of such a man.

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327 Filbert Steps
San Francisco, CA 94133
(415) 788-4072

Correspondence is invited.

Acknowledgements:
Special thanks to Steve Haller, National Park Service, Historian of the Presidio, and John Martini, National Park Service, Curator of Military History at the Presidio, Golden Gate National Recreation Area (GGNRA), San Francisco, CA, for encouragement and sources [1,15,16] below. Special thanks also to Robert Stinnett, author of GEORGE BUSH, *HIS WORLD WAR II YEARS* for the very hard-to-get hard copy 1928 radio intercept [5], and to Will Jensby, CHRS, AWA for again helping me with his expertise and numerous sources, including [2,4,6,12].

References:

1. ARCHIVES of the Presidio, National Park Service — GOGA, Presidio Army Records Center; Plans of Building 312, the WVY receiving station are courtesy John Martini, National Park Service, Curator of Military History at the Presidio, GGNRA.

2. CODES AND CIPHERS, Mixler, ed.; courtesy of Will Jensby, CHRS, AWA. Photo of then Col. Mauborgne about 1932, p. 128.

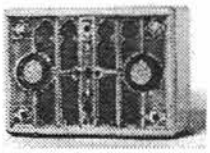
3. COMMUNICATIONS RECEIVERS The Vacuum Tube Era: 50 Glorious Years (1st ed.) by Raymond S. Moore, (RSM Publications, Walpole, MA, 1987, ISBN 0-9618882-0-2) illustrating Hammerlund Radio Company superheterodyne receiver, called the "Comet," circa 1931, p. 59.

continued on page 15

INTERNATIONAL RADIO CORP.

Alan Voorhees

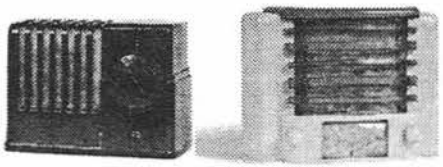
In the 1920s, when radio manufacturing was in its infancy, a businessman in Ann Arbor, Michigan started making a line of radios known as "Arborphone." Charles Verschoor didn't make his mark on the radio world, however, until 1931 when he started the International Radio Corporation following a spectacular fire that destroyed the Arborphone manufacturing plant in January of that year.



Among the first products was a diminutive little radio with a plastic case, the *Kadette*. The compact size of the radio was accomplished by using an innovative new circuit, one which strung all the tubes in series like Christmas tree lights. This set, which would operate on either AC or DC current no longer required a power transformer, and that made it lighter , smaller, and cheaper than the other sets on the market.

Its plastic case was noteworthy as well. Manufactured for International Radio by the Chicago Molded Products Co., it marked the beginning of a new era in cabinet design by being the first set housed in plastic. Its design was rather traditional, having a strong Gothic look with arches on the front of the case. The radio was a hit with the American public, and it's popularity led to the almost immediate profitability of International Radio. Within two years, International Radio was the only Ann Arbor corporation that was still paying dividends to it's shareholders.

Other innovative sets followed in rapid order. The following year the *Kadette Jr.* appeared. It had two dual-purpose tubes and was the world's first pocket sized set—albeit a coat pocket sized one. By this time the first *Kadette* model had been refined into the handsome *Kadette Jewel*, which appeared in



five standard color combinations. Like with some other *Kadette* models, Chicago Molded Products made a few cases in other, often unusual, color combinations.

In 1936, just as Sears was jumping on the bandwagon with its first plastic set, the "Streamliner" (model 4500, above left) in basic black Bakelite, International was releasing the *Kadette Classic* (above right)—a set with a cabinet molded in three different plastics. It was ultimately available in seven color combinations, among them an ivory case with contrasting grill and green, yellow, rose, or blue top and a jet-black case with an ivory grill and a bright vermillion red top. The set resembled a colorful room heater, and the front and the back looked basically the same allowing the radio to be placed away from the wall and still be attractive from behind.

Wooden cased sets also got the International touch. An unusual set, the *Kadette Clockette* was introduced in four styles in wood (and in various plastics as well) and resembled a small mantle clock. Its compact size was typical of many of the International Radio sets. "a five tube set in half the space" their ad proclaims. The speaker hid behind a brass screen in the center of a large round grill.

A number of other cabinet styles emerged as well. Some were intriguing, deco-inspired designs, others plain and unremarkable in appearance.

Then in 1937 they introduced a coup in the radio retailing world. A 10-tube set for the price of an ordinary cheap 4- or 5-tube model. When other manufacturers were producing 10-tube radios with price tags that *started* around $100, the low $19.95 tag on the *Kadette* line were nearly a miracle. International had actually pulled a fast one on the public. The sets contained three ballast tubes among the ten. Their only purpose was to drop the voltage enough for the tube filaments to work properly. One would have been sufficient. The sets weren't really great...they worked as well as other $20 sets, and that's all they really were...$20 sets with extra ballast tubes thrown in.

The 10 tube *Kadettes* had a rapid turnover, but they carried profit margins or 15% or less. Radio dealers had to move a around a dozen of the *Kadettes* to equal the profit they could get selling one premium radio. International began making the dealers take additional slower selling *Kadette* models in order to get the 10-tube sets.

Dealers had to offer under-the-counter discounts to move the radios, and their aggregate profit on *Kadette* radios could drop to as low as only 5%. This led to dealers dropping the *Kadette* line in favor of other manufacturers. International scrambled to rectify the problem, but were too late to repair much of the damage they had done.

In 1939 International sold the radio manufacturing business as well as the *Kadette* name to W. Keene Jackson, who had been International Radio's General Sales Manager. Jackson and the new company, the Kadette Radio Corp., planned to introduce television sets to the *Kadette* line. "The Kadette Radio Corp. is going to employ every technical resource to bring the price of efficient television reception to the point where every American home can enjoy this new art as quickly as possible." he said.

The problems of the *Kadette* sales that plagued International Radio hindered the new company as well, and in about a year they ceased operation. In the meantime, International Industries flourished with their lines of camera and optical equipment manufacturing under the *Argus* brand. The *Argus Compact* camera had been released by International in 1936 and became an instant success, selling 30,000 the first week it was available.

After the sale of the radio business, International Industries and their new International Research division continued with great success. At the end of the war they became a wholly owned subsidiary of Argus, Inc. and the International name ceased to exist.

CHRS member Alan Voorhees was raised in Ann Arbor and has a special interest in the radios manufactured there. Kadette *sets pictured on the cover and with this article are from his collection.*

References:

Kadette Marketing Error, Arthur Adams, CHRS *Journal*, Vol. 18, No.1

A History of Ann Arbor, Jonathan L. Marwil, Ann Arbor Observer Co., 1987

The Amazing Argus, Bill Hinton, Ann Arbor Observer, 1982

Ann Arbor News, Jan. 6, 1931; July 9, 1939

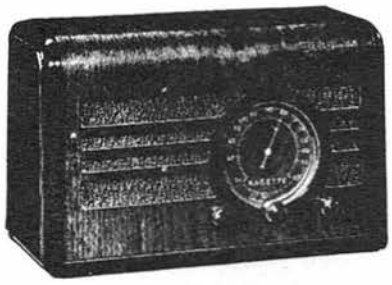
Ann Arbor City Directories, 1930–1948

Special Thanks to Ken Nevins, Nevins Museum of Radio, for providing historical material.

23 NEW MODELS FROM A $10 COMPACT TO THE FINEST CONSOLES

KADETTE 76—6-tube, AC-DC, TRF receiver at unusually low price. Standard broadcast and top police bands. 5" dynamic speaker, rich, full tones. Coils tropically impregnated. Selected American walnut veneer cabinet with unusual vertical grille. 9" high, 11½" wide, 6" deep. Net weight 7½ lbs. List.....**$14.95**

KADETTE 86—A 6-tube AC-DC receiver. Standard broadcast. Amateur, airplane and all police bands. Illuminated and protected dial. Coils impregnated against moisture. Full 5" electro-dynamic speaker. Modern American walnut cabinet. Height 9½", width 13", depth 6¾". Net weight 8½ lbs. List.....**$22.50**



KADETTE 87—Powerful 7-tube World-Wide AC-DC Superheterodyne. Regular broadcast and American-Foreign short-wave bands. Automatic volume control. Coils tropically impregnated. 6" electro-dynamic speaker, powerful output, rich, glorious tone. Lay-down cabinet of American walnut. Height 10", width 16", depth 6¾". Net weight, 11 lbs. List.....**$29.95**

A NEW $10 LEADER

JEWEL Model 40—A new leader at a new low price—the original AC-DC compact greatly improved. By far the greatest radio value on the market. So small, so light (but 3¾ lbs.), yet giving wonderful performance with superb tone. List.....**$10.00**

JEWEL Model 41—The same world famous original AC-DC compact in scratch-proof walnut Bakelite case. List.....**$11.50**

JEWEL Model 43—Another of the improved line in ivory Plaskon case, with jewel-like grille. List.....**$12.50**

JEWEL Model 44—Chinese red Plaskon case. Like all Jewel models it's but 5½" high, 7½" wide, and 3¾" deep.....**$12.50**

●

KADETTE WILL AGAIN CHANGE THE RADIO TREND

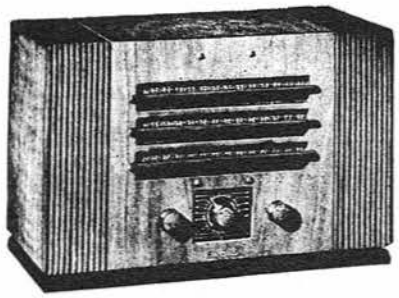
This year we will place our entire merchandising efforts behind the "Kadette" name. Kadette will use both national magazines and large newspaper space this year. Individual mailing pieces, envelope stuffers, complete line folders, four color window displays, bright metal and enamel counter signs and display stands, etc., are now ready. Also effective dealer mailings, catalog pages, newspaper mats, selling portfolios, etc., for distributors.

There has been a constant strengthening of our distribution organization. Our organization has been active in eliminating unsound trade practices in the industry. These facts, coupled with a greater use of advertising during 1937, are Kadette's expression of confidence in the future of the radio business. Kadette invites aggressive merchants to join them in merchandising the best radio values of 1937 and pledges wholehearted support in their endeavors.

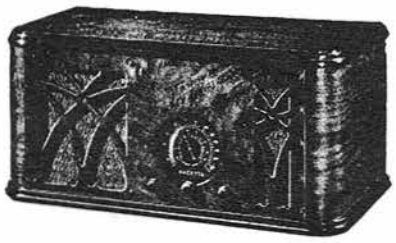
● ● ●

If you want to be identified with the greatest radio values of 1937, if you believe in handling merchandise that is in advance of competition, if you want to sell radios that are styled for 1937 and carry a decided price advantage . . . you will write for full information immediately.

KADETTE 66X—6-tube AC-DC Superheterodyne. Standard broadcast, amateur, airplane and all police bands. 5" electro-dynamic speaker—full, glorious tone, high output. American walnut veneer cabinet. 9" high, 13¾" wide, 6" deep. Net weight 8 lbs. List.....**$19.95**



KADETTE battery Model 400—Portable 4-tube Superheterodyne radio for farm homes, rural schools, boats, cottages, camps, house trailers and all unwired locations. Automatic volume control. Standard Broadcast and Short Wave. Uses 3 ordinary 1½ volt No. 6 ignition cells (approximately 300 hours' service)—and 3 portable size "B" batteries. New Perm-O-Flux 6⅝" dynamic speaker. Beautiful walnut cabinet. 16" long, 10¾" high, and 7" wide. Weight with batteries, 25 lbs. List.....**$29.95**



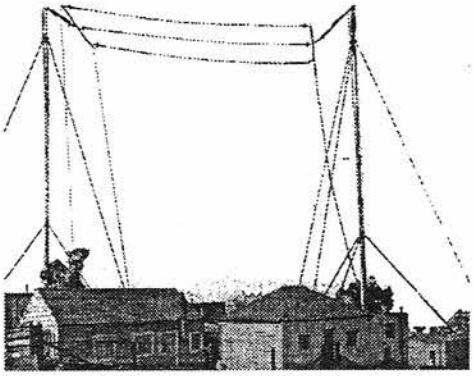
BATTERY Model 500—five-tube 2-volt, battery-operated Superheterodyne. Comparable in sensitivity, volume and tone to higher priced electrically-operated sets. Standard broadcast and American-Foreign Short Wave. Automatic volume control. Coils tropically impregnated. 6¾" Perm-O-Flux permanent dynamic speaker. Space in cabinet for all batteries. American walnut veneer with butt walnut front panel. Height 11", width 24", depth 11¾". Net weight (less batteries), 15½ lbs. List.....**$32.50**

KADETTE

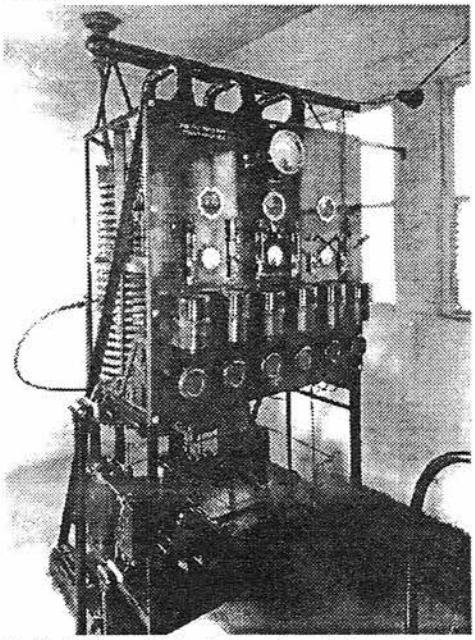
INTERNATIONAL RADIO CORPORATION, ANN ARBOR, MICH., U.S.A.

THE RADIO HISTORY OF TELEGRAPH HILL

Bart Lee



I. Telegraph Hill radio station KFDB (1922) studio building (left) and the transmitter building at the North West corner of Kearny and Lombard Streets, showing the antenna emphasized and deliniated.



II. The 1,000 watt 1922 radio transmitter of Telegraph Hill radio station KFDB, made by Ralph M. Heintz of Heintz and Kaufman, San Francisco.

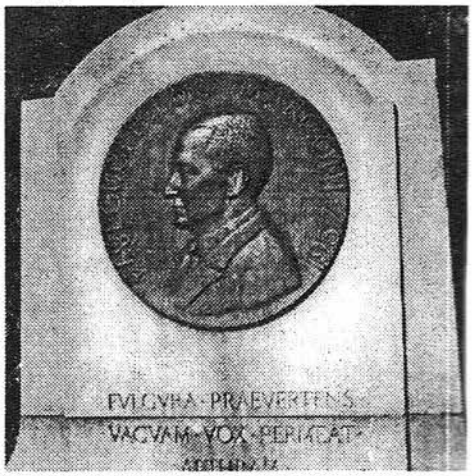
Telegraph Hill, most widely known for its spectacular views and cozy micro-neighborhoods, as well as its bohemian past, has another historical dimension as well: birthplace of much modern technology.

Telegraph Hill has a distinguished place in the history of communications. The semaphore marine telegraph of the Gold Rush days gave it its name in 1850. This was, however, replaced in 1853 by a wire-line electrical telegraph between Point Lobos and the Merchants Exchange Building downtown, bypassing the Hill. (See generally David Myrick's *San Francisco's Telegraph Hill*)[1]. It was some 40 years later, however, that inventors and engineers turned to the idea of telegraphy without wires; i.e., "Wireless" or what we call Radio. By 1895, Gugliermo (William) Marconi was sending electrical signals, created by high voltage sparks, through what was then thought of as the "ether" (of his northern Italy, and then in England on the Salisbury plain and soon across the English Channel). Word spread of this new miracle fast throughout the civilized world, of which San Francisco was then, of course, a highly civilized part.

In April of 1899, the *San Francisco Call* newspaper began to experiment with wireless telegraphy. One spark station was at the top of their building at Third and Market streets, and the receiver was on the South side of Telegraph Hill, likely between Montgomery and Kearny south of Union Street. This is described in the *Call's* news stories of 1899.[2] These experiments were successful enough to justify more in quieter locations, away from the interfering sparks of streetcars. In that August of 1899, the *Call* successfully used its wireless gear to signal from the Coast Guard lightship *San Francisco* to the Cliff House, that a long awaited returning troopship had been sighted heading for the Golden Gate. A huge celebration for the local soldiers returning from the Philippines and the Spanish American War ensued on the *Call's* scoop. This was the first successful use of radio in America. To this day the Coast Guard radio service takes pride in its part in these early events.

In 1903, experimenters again employed the height of Telegraph Hill to wireless advantage. Timothy Furlong, one of the very first radio operators in San Francisco, communicated between Telegraph Hill and Bernal Heights with a spark set. He made his "receiver" from a needle on two carbon rods, connected to an antenna and ground, and a telephone earpiece.[6]

At the time and after this, Marconi's wireless fame was spreading around the world. His company established their spark wireless stations likewise. One was in Bolinas, in Marin County, from 1912 on. Marconi visited San Francisco perhaps as early as 1906, according to his daughter Sonia Bragga. He received the Nobel Prize in 1909. San Francisco's strong Italian American community took great pride in this Son of Italy (although it is worth noting that his



success in England followed from the fact his mother was an heir to the Jameson's Irish Whiskey fortune). In any event, Telegraph Hill became in the 1939 the site of a Bas-relief monument to Marconi, now sited in the parklet at Kearny, Lombard and Telegraph Boulevard, put up by the *Call* and the Sons of Italy. Its Latin inscription translates something like: "Now quicker than lightning, [Man's] voice now races throughout the sky."[7] San Francisco made Marconi an honorary citizen with great civic to do, in October, 1933. Marconi's acceptance seems to indicate that it was his first time in California; he enjoyed Yosemite.[8]

In these early decades, wireless had evolved into radio broadcasting, much as we have come to know it. Sparks were replaced with vacuum tubes (radio tubes), perfected in Palo Alto in 1912 by their inventor, Lee DeForest. By 1919, DeForest was beginning to broadcast in San Francisco, and even before the First World War, Charles D. "Doc" Herrold in San Jose had been "on the air" broadcasting, as early as 1909, with probably

the world's first broadcasting station. This was the linear ancestor of today's KCBS. In 1915 Herrold broadcast to DeForest at the San Francisco International Exposition, from which the Palace of Fine Arts remains.

By 1922 local entrepreneurs saw great opportunity in radio broadcasting. Telegraph Hill's central Bay location commended itself to one of the leading engineers of the day, Ralph M. Heintz of Palo Alto.

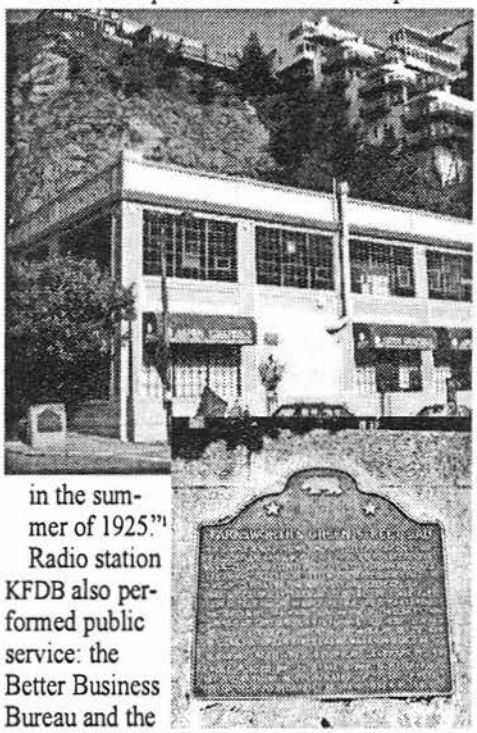
Ralph Heintz established one of the very first post First War radio stations in 1922, callsign KFDB, just across Telegraph Boulevard from the present Marconi Memorial, in a house at Lombard and Kearny. Nearby is a photo of its studio and transmitter buildings and antenna, and another of its big industrial-size 1922 transmitter.[5] This station is also discussed in Myrick's *Telegraph Hill*[1], with a photo of the antenna taken from what is now the Coit Tower parking lot.

Heintz recalled his 1922 radio station sixty years later in 1982:

> "The Mercantile Trust Company wanted to be able to broadcast produce, market quotations for advertising purposes, so I built them a transmitter. It was on Telegraph Hill, with the call letters KFDB. They put out the stock market and beef quotations: so much for prime, so much for something else. and so much for baloney bulls. Apparently, bulls were used for baloney in those days. And then eggs and all that, all the commodities, they did that, and then they put on a program in the evening of phonograph records, mostly. They gingerly tried studio broadcasts. This was in an old residence up on top of Telegraph Hill. It turned out pretty well as the first American broadcast station, as far as I know, that had been heard in Australia."[3]

Myrick summarizes the history of the radio station:

> "Two 100 [*sic*; more like 50] foot wooden towers and several smaller buildings appeared on the [Lombard and Kearny] corner in 1922. One building contained electronic gear, the other a well-padded studio, and all were for the radio station build by Ralph M. Heintz for the Mercantile Trust Company (now the Wells Fargo Bank). With its permit dated August 23, 1922 in hand, KFDB began broadcasting from its 1,500 [*sic*; 1,000] watt transmitter (then considered the most powerful on the Pacific Coast) and under favorable conditions [it] could be heard as far away as Honolulu or Atlanta. Broadcasting time was brief: only one hour each morning, afternoon and evening during weekdays, while on Sunday the station was silent. The life of KFDB was short; by August 18, 1923 it was off the air. The towers and the buildings were removed and in their place six flats were completed in the summer of 1925."[1]



Radio station KFDB also performed public service: the Better Business Bureau and the Advertising Club took to the "air" to warn of fake oil stock promotions, with some success. The lawyer for the Advertising Club, at a related public meeting: "If the Mercantile Trust Company had never done anything else with its radio equipment, this one case has more than justified its existence."[9]

As radio followed wireless, television followed radio. In the 1920s, television experimentation also took to the radio waves, but it involved spinning mechanical disk systems. A young man from Utah, Philo T. Farnsworth, came to San Francisco with an idea he'd had in 1914 about how to make an electric television. He put together a laboratory on Green Street, in the still existing building at the corner of Sansome Street. There he figured out how to turn an image into an electrical signal directly, without mechanical scanning. He invented television as we know it in 1927 at the foot of Telegraph Hill. An historical marker appears in front of the building, which proclaims: "FARNSWORTH'S GREEN STREET LAB."

> "In a simple laboratory on this site, 202 Green Street, Philo Taylor Farnsworth, U.S. Pioneer in electronics, invented and patented the first operational all-electronic "television system" on September 27, 1927. The 21 year old inventor and several dedicated assistants successfully transmitted the first all electronic television image, the major breakthrough that brought the practical form of the invention to mankind. Further patents formulated here covered the basic concepts essential to modern television. The Genius of Green Street, as he was known, died in 1971."[4]

Phil Farnsworth and his invention made a significant number of San Franciscans, who had the foresight to invest in his high tech start-up, quite rich. Telegraph Hill thus earned a place in the history of technology, all the while enjoying itself in all the ways for which it is even better known.

This Note (edited) appeared in the SEMAPHORE, the Journal of the Telegraph Hill Dwellers Association in San Francisco. Bart Lee is a long-time member of the Telegraph Hill Dwellers, and a trial and appellate lawyer by trade.

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   The story of the marine telegraph appears at p. 27ff.
   The photo of the antenna taken from what is now the Coit Tower parking lot appears at p. 72.
   The story of KFDB is told on p. 201.
2. *San Francisco Call* August 26, 1899, page 1, CALIFORNIA HEROES HOME FROM THE PHILIPPINES; WIRELESS TELEGRAPHY EXCITES MUCH INTEREST.
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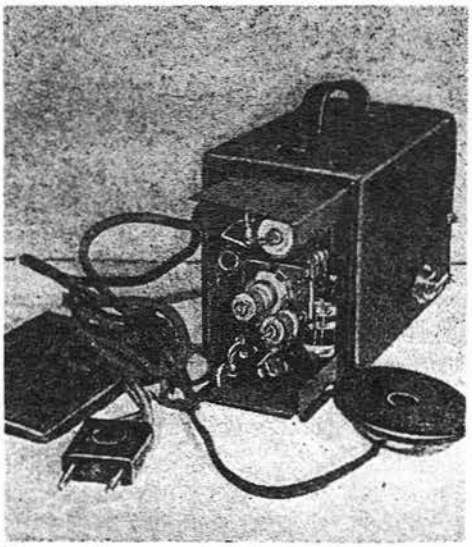
DUTCH UNDERGROUND RADIOS

By J. Maquerinck
From *Radio-Craft*, March 1947



"Brownie" receiver built by Mr. F. M. Leopold of Eindhoven, Holland.

When the Nazis, who had occupied Holland since 1940, forbade all radio listening and confiscated all receivers in the spring of 1942, radio listening was driven underground. Only by listening to the BBC and Radio Boston could we know how the war was going. It is my purpose to tell you something about the sets we built and how we concealed them.

Let me begin with the receiver built by a friend of mine. Luckily he was the owner of a crystal, and so he built the set the schematic of which is given by Fig. 1. The entire assembly was placed in a cigar box, complete

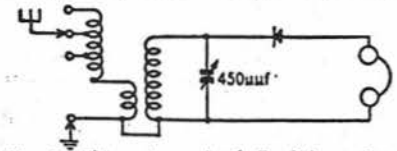


Fig. 1—This set received English stations.

with headset and tuning condenser. When he wanted to listen, he opened the box, connected ground and antenna, put the headphones on his head and tuned the circuit. This set was very selective and the only disadvantage was

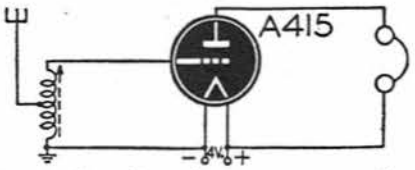


Fig. 2—One-tube radios were more sensitive.

its weak reception.

My neighbor, in a set the diagram of which is given in Fig. 2, used an old battery tube. The plate voltage was taken from the A-battery and the results were much better than those obtained with a crystal detector. The coil was tuned with an iron-powder core only

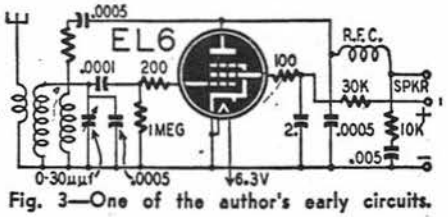


Fig. 3—One of the author's early circuits.

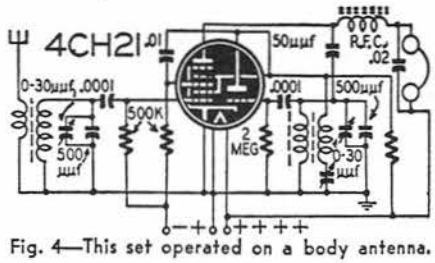


Fig. 4—This set operated on a body antenna.

and no condenser was used. Tuning was not very sharp, but this wasn't needed in the beginning, because the German interference transmitters did not come until later on.

It had a high-m beam-power pentode, connected as feedback detector. It gave good speaker output and was sensitive enough to play on a 30-foot antenna. It was tuned by an iron-core coil and a fixed condenser with a trimmer for just alignment. So it was fixed on 200 kc, the BBC wavelength. Tube was an EL6.

This set worked very well, but it couldn't be hidden. Besides, it needed an antenna, and an outside antenna would be seen.

I decided to build a set that didn't need an external, antenna. The result you see in Fig. 4. It uses a triode-heptode tube which has three functions: r.f. amplifier, grid leak detector, audio amplifier. The plate supply, being 43 volts, is obtained from the A-battery. The tube, a U.C.H. 21, operates with this heater voltage. The coils are of the iron-core type wound on a low-loss form with core in center. The set is tuned with a fixed condenser of 500 mmf and a 3-30 μμf trimmer across it. The coils are shielded by pieces of copper sheet,

Fig. 5—A real radio-telephone.

bent in the right form. Needless to say the tuned wavelength was 200 kc.

Tube, coils, resistors and condenser, r.f. choke and A-battery—the entire equipment was put into a phone cabinet after I had

removed the phone parts. Fig. 5 shows how it looked.

This was a very satisfactory was of concealing the set and I didn't need a cabinet. That the phone was dead wasn't much loss, because it had been defective for months. An antenna wasn't needed, because my finger

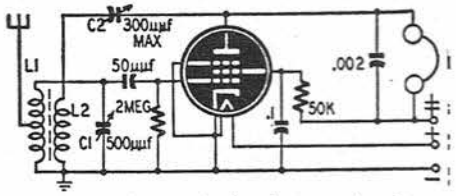


Fig. 6—Another standard underground receiver.

was antenna enough. Maybe I have a very high body capacity, but I think it was because of the high sensitivity of the set. A ground was provided by the old telephone ground line. To operate the set you had to turn the dial to seven and pick up the earphone. After that you could wait for Big Ben.

To avoid discovery by anybody who might want to use the telephone and by chance turn the dial to seven, I put a piece of paper above it. "Pas op! Niet gehruiken, Defect." This means in English: "Take care. Don't use. Defective!" In September, 1944, the Airborne Troops came down over our town and Arnhem had to be evacuated. When I returned everything in the house had been stolen, except my receiver! The Hun had not discovered it!

In Aalten, to which I was evacuated, a town of about 10,000 inhabitants, it wasn't so very difficult to listen to the Voice of Freedom, because there were not so many Nazis in the village.

The man whose house was my home for some time never had a receiver before the war, but now he had one. It was made by the serviceman in the village and gave very satisfactory results. The circuit diagram is given in Fig. 6 and you can see it is a very common type of regenerative detector. The tube used is an EF-g, a tube somewhat similar to the 6K7 but with better power output.

Tuning is by an iron-core coil and a variable condenser (L1, C1). The circuit regenerates by means of the tickler coil L2, and is controlled by C2. Two plug-in coils, made from old tube sockets, were available, one for 200 kc. and one for 1000 kc. The former tuned in BBC; the latter, the broadcasting station in already liberated Holland.

The set was fed by external batteries, but the receiver itself was placed in a small wooden box and looked very good. Later on the detector was coupled to a power amplifier which drove a 5-inch pm speaker. It gave the best results I have heard from a two-tube receiver.

Mr. Maquernick was unable to take photos of his radios. These underground sets were described in an article in the Philips Technisch Tijdschrift

THE RADIO SPY IN THE PRESIDO

Continued from page 9

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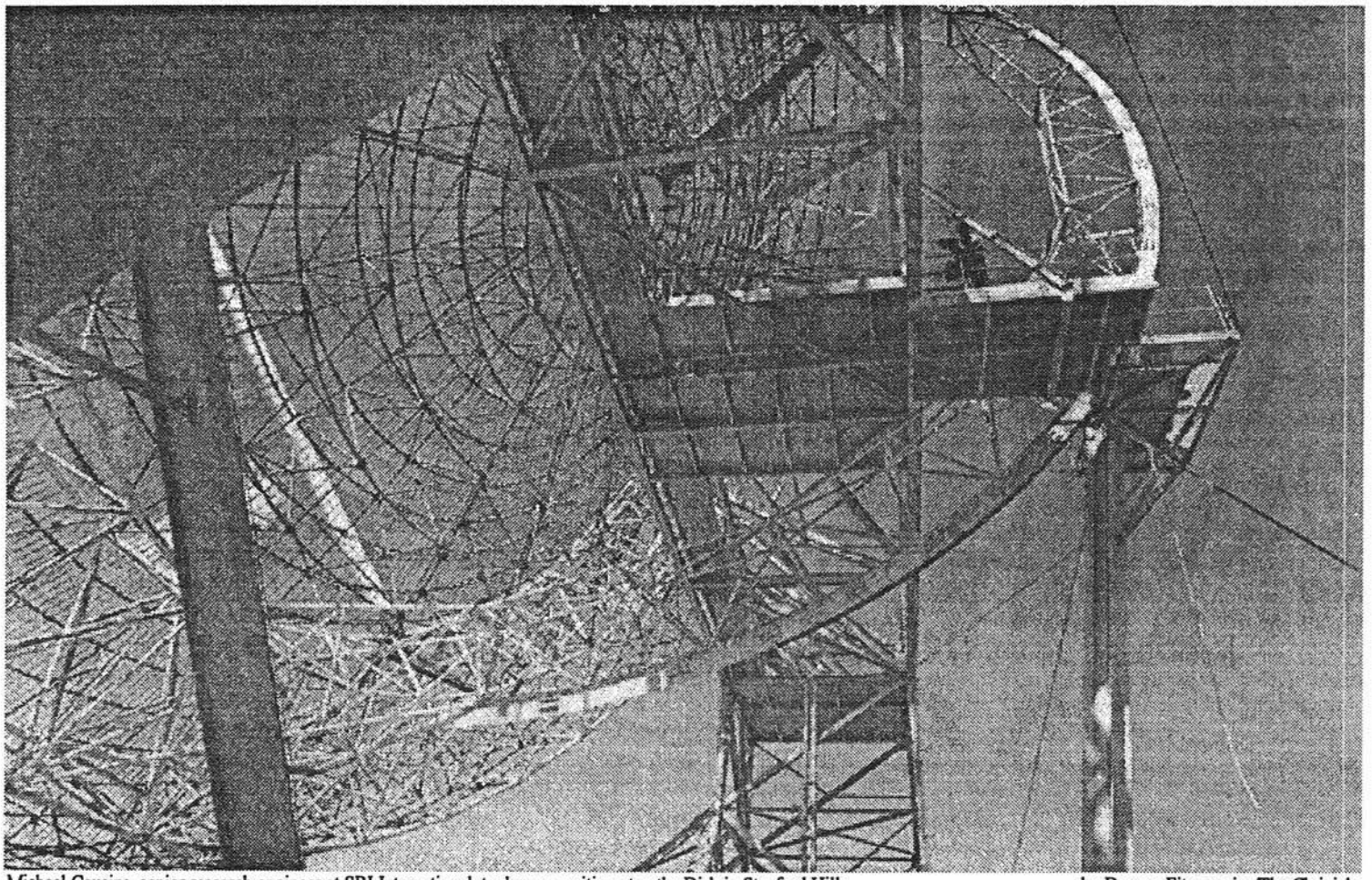
STANFORD DISH TUNING IN AGAIN

'60s antenna to be used in Mars project

By Michael McCabe, Chronicle Peninsula Bureau



Michael Cousins, senior research engineer at SRI International, took up a position atop the Dish in Stanford Hills by Deanne Fitzmaurice/The Chrinicle

For decades, the Dish dominating the Stanford University hills riveted newcomers to Northern California as they drove south on Interstate Highway 280.

Aimed skyward like a huge eyeball, the radio telescope has served for many as a kind of gatekeeper announcing the entrance to Silicon Valley and the seemingly limitless possibilities of science.

Plans are under way to use the 150-foot parabolic reflective antenna — which almost everybody on the Peninsula calls the Dish — as part of the planned Mars Global Surveyor Spacecraft program to study the Red Planet's surface from orbit. But few realize how dangerously close the Dish came to being declared obsolete.

Radio telescopes collect and focus radio waves. A dish, the bowl-shaped metal reflector, concentrates the weak radio signals from space and focuses them on an antenna. The antenna converts the radio waves into electric signals. A radio receiver strengthens these signals, which are then recorded by computer.

The Dish's problem was mainly noise pollution. There was too much background noise being generated in the Bay Area, from appliances, televisions and, increasingly, cellular telephones. The dish's ability to do worthwhile radio science was crippled.

In addition, because of the Dish's design, its effectiveness turned out to be limited to that part of the radio spectrum where noise was the biggest problem.

The eyeball was getting red with rust — and disuse. And it was coming under attack from a host of enemies — from critics who questioned its purpose, vandals and spider webs. The Dish was staring at the real possibility of being taken apart and disappearing entirely.

But with a growing demand for ways to keep track of spacecraft, and new ways of

dealing with noise, the Dish is getting a new lease on life.

For the Mars surveyor mapping mission, NASA wants to use the Dish to perform an inflight test while the spacecraft is still relatively near Earth, to make sure the communications system survived the launch and is fully functional. Scientists at the Dish receive data in the form of scrolling waterfall displays, similar to voice prints, which they analyze for patterns and structures.

The Mars Global Surveyor is scheduled to be launched in November. Even the Russians, who also hope to launch an orbiter and landing craft on Mars, are interested in the Dish.

Construction on the Dish began in 1960, and three years later, it was completed. Its mission was to do observational radio science, using its huge reflecting dish to pick up radio signals. At the time, it was the largest such facility in the country.

It was first used mainly in the Pioneer space probe program, during the 1960s and 1970s, to help study study solar winds. But when the Pioneer program ended in 1972, the Dish was a large white elephant in search of a mission. People began to notice that the Dish never moved.

"It sort of just sat up there for a long while, subject to rust and vandalism," said Michael D. Cousins, senior research engineer at SRI International, which operates the Dish on about 10 hilly acres leased from Stanford University. The Dish was built by SRI for the US. Department of Defense. It remains largely government property under the custodianship of SRI, and is used collaboratively by Stanford and SRI.

"A few people did experiments, but there wasn't much going on there," Cousins said there was a moment in time two years ago in March, when the tripod holding the dish antenna collapsed. Over the weekend, many of us wondered whether, like Humpty Dumpty, we were going to be able to put it back together again By Monday, we decided to fix it.

By that time, Cousins and Ivan Linscott, senior research ascociate at Stanford University's Star Lab, where they do radio science research, were trying to figure out ways to rescue the Dish.

Linscott looked at the noise problem again and found out that it wasn't as bad as previously thought. He also employed new methods to search for weak radio signals amid the noise — ways for the Dish to work within the noise and also remove it.

"What it has done is give us new life," Cousins said. "Ivan's work has sparked new interest in improving the Dish, and he has helped us to market the Dish to new customers, like NASA and the Jet Propulsion Lab."

The sprucing up so far has included a new coat of Rustoleum marlin blue paint. New computers have been installed. The aging hydraulic motors salvaged from World War II-era battleship guns, which move the 300,000-pound Dish into precise position (it can rotate on a track 360 degrees and be elevated 90 degrees) have been upgraded, as have the the radio receivers' old-style amplifiers. The cost so far has totaled about $250,000.

"It is such an attractive environment up there, to be able to just go into your own backyard and do research, rather than have to write proposals to the government to use facilities halfway around the world," Linscott said.

"And I think it will be quite an attractive way for us to be stepping into the new millennium, with a working facility like this right in our own backyard. It's great to see that big white elephant on the hill come back to life."

George Durfey, one of the three or four engineers who did the basic design of the facility more than 30 years ago, heartily agreed. Durfey, who lives high in the hills of Ladera, near Portola Valley, can see the newly painted Dish from his front door.

"It was the biggest thing I was ever associated with, and I still think it is a beautiful piece of sculpture," said Durfey, 70, who was senior research engineer at SRI. "When I drive by it, I'm proud of the part I had in building it my kids call it 'Papa's Dish.'"

SERVICING "MESSED-UP" SETS

Stan Lopes

The purpose of this article is to help recognize "tampered" circuits, tube misplacements and incorrect tube element connections. Information from this article was taken from The C-D Capacitor, a publication distributed monthly to repairmen by parts' houses or direct subscriptions.

After World War Two, when parts became available and during the war when short-cuts were the norm because of parts' shortages, it was often a challenge to repair sets that had previously been "tampered" with. Technicians were in short supply and trying their hand at fixing them were school boys, janitors, electricians and set owners. Some were so badly botched that dealers who received them to repair often refused!

One of the greatest difficulties in servicing these sets was to determine just how much tampering had occurred. Those who attempted to repair sets had to be careful not to assume that just because one circuit was changed that the rest of the set was suspect. The first step in determining if tampering had occurred was to examine solder connections. A hallmark of incompetent servicing is usually a sloppy job of soldering. Even so, sloppy soldering is not sufficient reason to decide that a circuit has been incorrectly serviced. An unfamiliar, odd-seeming circuit in a set that shows signs of meddling should be carefully analyzed. If any doubt is present, the circuit should be left alone and other circuits tested for the trouble.

To illustrate, take the case where a radioman found a plate of a 6P5 tube connected to its cathode with no voltage to B- from either elements. The technician raised an eyebrow at the hook-up, but left it alone and went on to correct other, more obvious tampering. Later, when the repair was complete, he found that there was nothing wrong with the hook-up on the 6P5 as the control grid was apparently being used as a diode plate.

Set owners, after bringing in tubes separately for testing, often insert them into the wrong sockets. On ac/dc sets this trouble is often readily apparent. On large sets, however, the difficulty may not be as obvious. When a condition of this kind is suspected, voltage tests at the socket constitute the best procedure.

Absence of filament voltage on any tubes may indicate that they are in the wrong sockets. For a simple case: no filament voltages were present on a 6SA7 and 6SQ7 of a large complicated receiver. Inspection showed that the filament supply leads went to pins 2 and 7 of the 6SQ7 and to 7 and 8 of the 6SA7 — this would be a positive revelation that the tubes had been reversed because filament pins are 2 and 7 for the 6SA7 and 7 and 8 for the 6SQ7.

Absence of plate or screen voltages on tube pins where they should be present, or the presence of high positive voltages where they do not belong, may indicate tube misplacement. When tube voltages are not noticeably different from normal by the interchange of tubes, however, determination of the trouble may not be too easy!

Memory is often a valuable tool in servicing messed-up sets. A case may be cited where a 6SH7 had been incorrectly substituted for a 6SG7 resulting in reduced volume. The serviceman remembered after working on the set for some time that he had never seen a 6SH7 used as an RF amplifier. He did remember seeing 6SG7's used in RF circuits of some sets. When he replaced the 6SH7 with a 6SG7, volume was returned to normal. Memory was the only possible tool here as the model number for the set was missing preventing schematic look-up.

Case where tampering is both gross and obvious needs little comment. Possibly every radio repairman has received sets for repair in which the set owner or other "expert" has replaced the resistance power cord with a line cord blowing out one or more tubes as a result. A set owner was even found to have unsoldered many connections in his radio only to join them back together with radio cement!

Another instance of gross, but not too obvious modifying, was the connection of an antenna to one side of the power line. This was in a set where the external antenna is mechanically, but not electrically, connected to the line cord (as in some FM sets with where a clamp couples the antenna circuit to the line cord). An electrician seeing the unconnected wire, thought it had worked loose from the plug, and connected it there. The result was a decrease in volume leading the owner to take the set to a more competent technician. The technician suspected that the antenna coil primary was defective and shorted it to B- to see if the volume would be affected. The resultant fuse blow-out led to quick location of the trouble.

Incompetent meddling is sometimes encountered. One of the most usual forms of sabotage is sometimes caused by a set owner who thinks he should tighten all loose screws like those on top of the tuning condenser or the I.F. transformers. This type of unintended sabotage is one of the worst things to troubleshoot.

One case was the 3-way portable (AC/DC/Battery) which had been misaligned and had in addition two intermittent defects. One was a screen resistor that opened only when the set was right side up and closed when the repairman turned it over for testing. The other intermittent was a 1A7 tube that tested perfectly, but became inoperative soon after the switch was turned on.

The combination was too much for one man, but a second technician's procedure, however, enabled him to fix the set very quickly. The defective screen resistor was a wire-wound, flexible type and had a slack, unwound section of wire at one terminal. When turned over the weight of the resistor caused it to open at this end. He was immediately suspicious of this resistor because the loose wire looked weak. With a voltmeter's test leads on the screen terminal of the tube he tugged gently at the resistor and on the second try an intermittent reading happened on the voltmeter. Replacement of the resistor followed.

He also replaced the 1A7 tube at the beginning of his troubleshooting with a new one—for test purposes—because 1A7's are notorious producers of intermittents, and he was determined to eliminate any suspicious producers of them at the very beginning. Correction of the misalignment was the only servicing job remaining, and that was fairly simple. When the original 1A7 was re-installed its faultiness became readily apparent now that the other troubles had been cleared up, and the new one was then permanently installed.

In troubleshooting, whether it be for normal or messed-up sets, inspection is a key to rapid location of problems. Those installed by the set owner being often the most difficult to determine.

COMMENTS ON: "REVIVING A HALLICRAFTERS S-38C"

Lane Upton

The article was great, until the author said "I found that the waters pipes were actually hot!". If this really was the case, they should have done something about the ground system instead of continuing work on the S-38. An elevated ground system is a very dangerous condition because it can relate back to the AC service feed from the utility power system.

The AC/DC short wave receivers of this vintage had one side of the AC line connected direct to the chassis for RF circuit reasons. The metal cabinets were isolated from the chassis by insulators (sometimes only cardboard). A by-pass capacitor (.01 µfd to .05 µfd) is connected between the chassis and the cabinet to provide the RF ground path, and the terminal for external ground is attached to the cabinet for RF grounding and shock protection.

I propose, in the situation described by this author, that there was continuity between chassis and cabinet, and, the AC plug was inserted such that the "hot" side of the AC line was connected to the chassis. When they connected the ground, the "hot" side of the AC Line was connected to ground. Who knows what the transients were in the radio that caused the demise of the 12SA7—the currents/voltages can be pretty horrendous under these conditions.

After servicing any radio of this type, a continuity check should always be made between the AC plug (with set turned on) and the cabinet and/or the ground terminal. This test was usually made by the manufacturer at 500 volts, against a leakage resistance specification in the megohm range.

The AC plug for any AC/DC radio should always be tried in both directions and left in the position where the radio plays best. This generally will place the ground side, or chassis, of the radio at the grounded side of the AC line.

I also must disagree with the editor's suggestion of using a capacitor in the ground system. The use of a capacitor does not provide the necessary ground path for DC—a static charge and/or a lightning stroke are two examples of why a DC path is always necessary! I very strongly agree with having a common ground point in the shop area, and it should be fed to the nearest cold water pipe, or other suitable ground, with at least #10 copper wire. The ground must be the strongest link in the system, otherwise it cannot guarantee protection.

Also,. if a high value capacitor (more than 1 µfd) is used in this type of situation, it should always have some form of bleeder to assure that it does not hold a residual charge. Otherwise the capacitor could charge up and become a shock hazard.

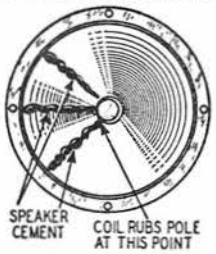
The antenna system should have a well grounded lightning arrester, and, should be bled to ground through a resistor of 100K to 470K. An antenna can take a static charge during a thunderstorm period, or simply from the wind blowing across the wire. An antenna has considerable capacitance to ground and can provide quite a shock due to the stored energy. The use of a bleeder resistor will keep the static charge bled off, and can at times, reduce static caused by this charge. This was the secret to the "low noise" antennas of the 1930's.

A neon lamp can also be placed across the antenna and ground terminals as a charge limiter and indicator. They will fire at 45 to 65 volts, and, it is rather interesting to watch the Lamp flicker during a thunderstorm.

Incidentally, the S-38C had a list price of $59.95 in 1954, and did not require any box tops.

SPEAKER KINK

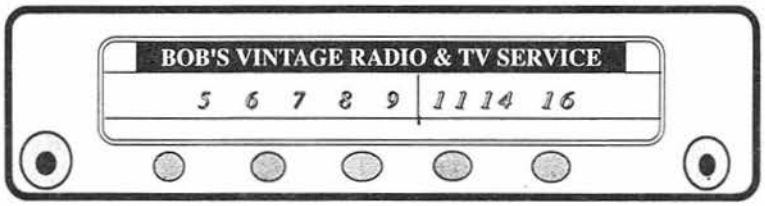
Here is a method that I use for re-centering speaker voice coils when they cannot be centered by any other means. I apply 3 radiating rows of speaker cement, about ¼ inch wide, on the side of the cone where it is rubbing the pole



piece. The cement is warmed so that it will dry quickly. The drying cement shrinks the cone on one side and re-centers the voice coil.

WALTER C. WILLIAMS,
Youngstown, Ohio

(If shims are put in place before the cement is applied, a better job of centering can be done.—Editor)



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BUILDING POWER SUPPLIES

Norman Leal

Several have asked for information on building a power supply for early battery radios. Actually it is easy to understand and construct a supply if it is looked at in sections.

The "A" Supply should be regulated as it is used to control the radio volume. You do not need to regulate the "B" or "C" Supply.

First you need a transformer or transformers. For the "A" Supply 8 to 12 volts @ 2 amps will do if the radio uses 5 or 6 01A's. A 6.3 volt filament transformer will do if you plan to only power 30's, 99's or other tubes with filaments under 4 volts. A transformer for AC Radios will work if it has 6.3 and 5 volt windings. In series and in phase it will give 11 volts. Any combination of windings can be used as long as they have enough current and voltage.

The "A" Supply is made simple by the use of a LM317T regulator. It can supply 1.5 Amps. If more current is needed other regulators are available. Mount the LM317T on a heat sink and be sure to insulate the mounting tab with mica as it is connected to the output terminal. If the LM317T is not properly heat sinked it will overheat and shut down. It will recover when cool.

Two resistors determine the output voltage. With R1 being 270 ohms and R2 1K ohms the output voltage will he around 5.9 volts. This will be sufficient for 01A's in a radio controlled by a rheostat. If R2 is reduced to 270 ohms the output will be around 2.5 volts, sufficient to operate 30's. If R2 is made a 1000 ohm pot the supply will be variable/regulated. This will give an output voltage from 1.25 volts to around 5.9 volts and will be sufficient for WD11, 30, 99, O1A or other tubes using filament voltages in this range.

The formula for output voltage: V out = 1.25 (1+R2/R1)

Values of other components are not critical.

The "B" Supply requires an isolation transformer. A N51X is fine but if unavailable 2 filament transformers back to back will work. A transformer made for 110 or 220 volts with 2 primaries will also work. Use one primary winding for input and the other output. Early battery radios require up to 3 "B" voltages—High 90–135, Med 67–90 and detector 22–45. These radios usually draw from 20 to 40 ma from the "B" Supply.

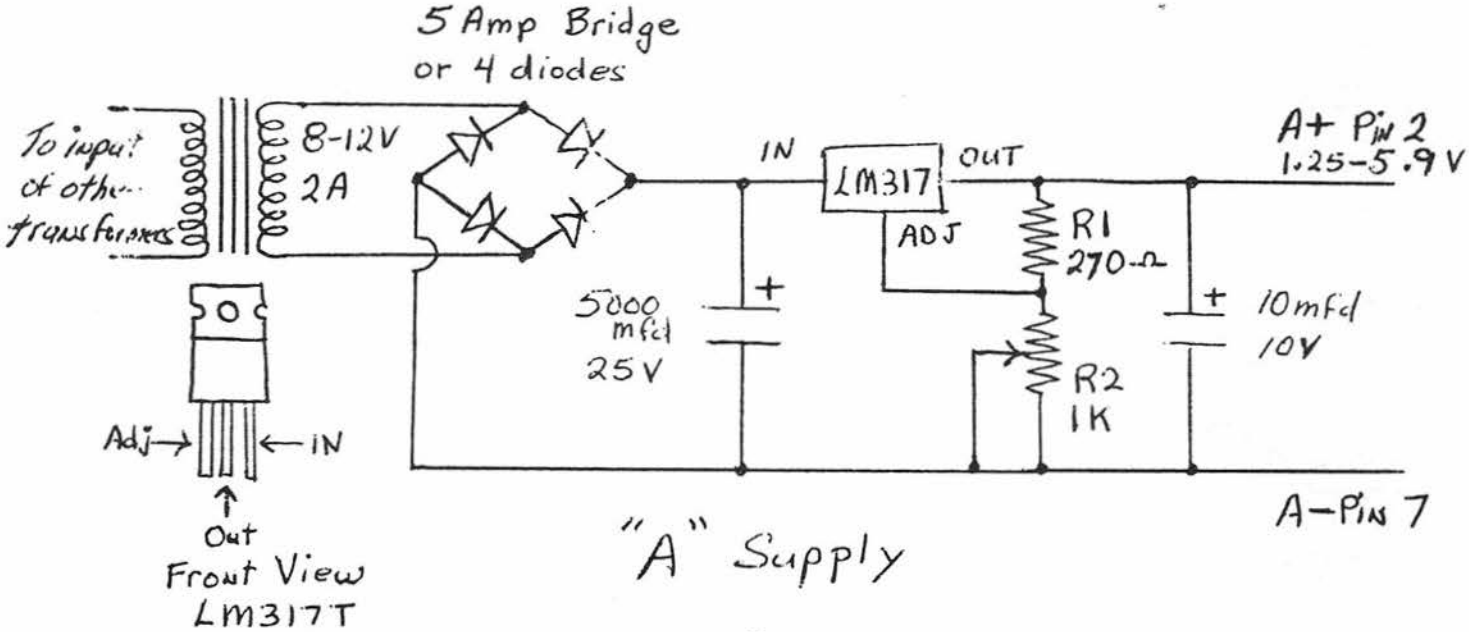
A small transformer can be used for the "C" Supply as this one does not draw noticeable current. A small 6.3 volt filament transformer will work if you plan to operate 01A's and 99's etc. If a power tube such as the 71A is used a small 24 volt transformer can be used. The "C" Supply can be made variable with a small 100K pot. Not all early radios used the "C" supply.

I bring power from my supply to the battery radio through an octal socket. Each of my battery radios have their own harness with an octal plug so one power supply can be used for any radio. The octal plugs can be taken from tubes like 6SN7 etc.

I use the following pinout:
Pin 1 = C-
Pin 2 = A+
Pin 3 = B+ High
Pin 4 = B+ Med
Pin 5 = B+ Det
Pin 6 = C+
Pin 7 = A-
Pin 8 = B-

Before connecting the supply to the radio set the "A" voltage about .5 volts above what is required by the tube filaments. This will allow the radio rheostat to control the volume. The "B" Supply is not regulated and will read high until the radio is in operation. If your radio only requires two "B" voltages use B+ Det and B+ Med. The "C" Supply, if used, may be set to -4.5 volts. It can be adjusted later to give the best volume and quality.

The early battery radios require an external high impedance speaker and antenna. Do not connect the ground terminal as this is supplied from the AC line. Have fun!



REFINISHING CABINETS AND SALVAGING THE DECALS

by Lynn and Martin Love

My wife Lynn and I picked up a 1947 Sparton console at a garage sale for twenty bucks. The cabinet was a basket case but could be restored by a complete refinish. I pondered over the dilemma of stripping the original finish and retaining the decal. I am not aware of any Sparton decals that are available.

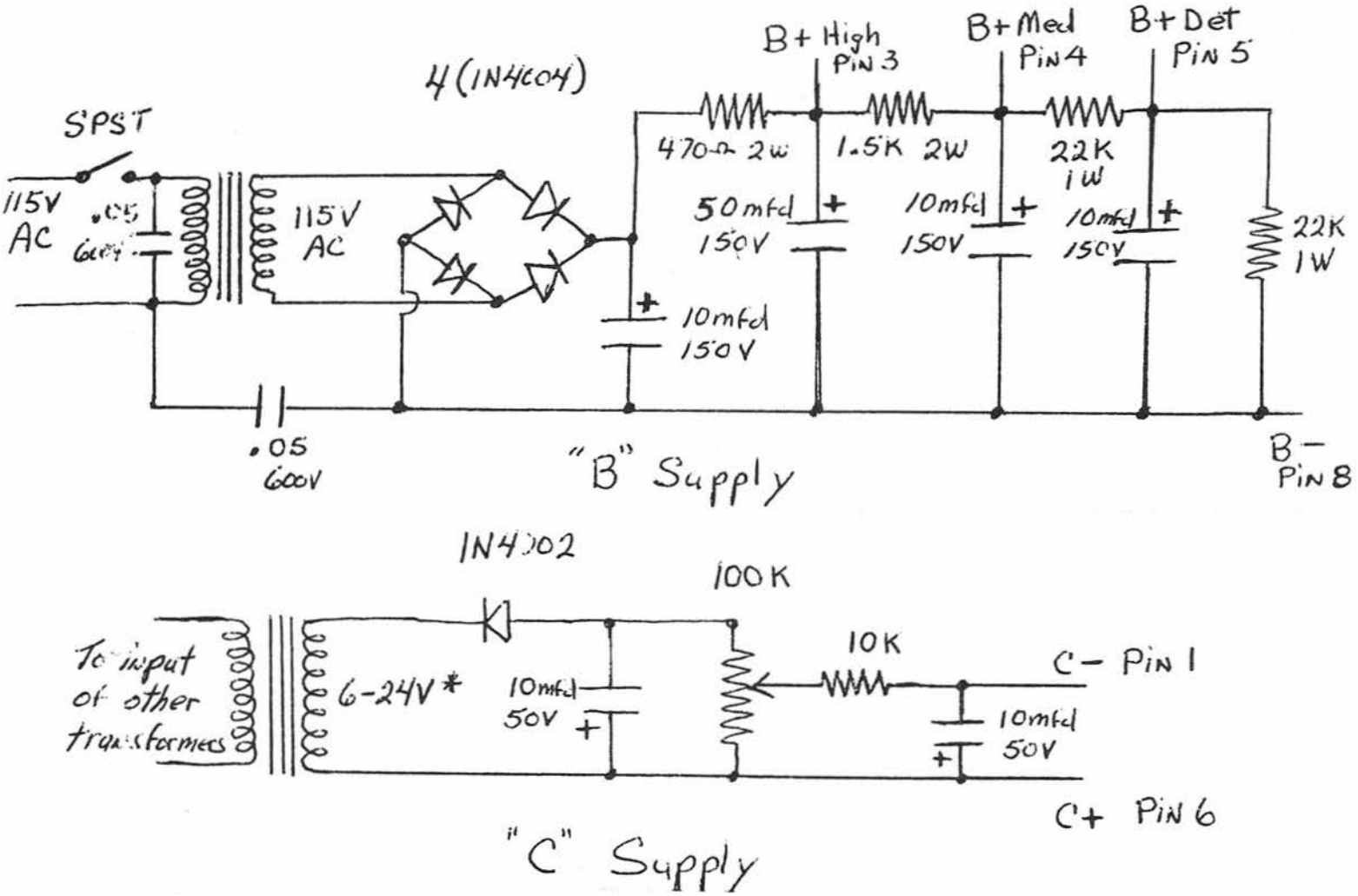
This brought me to the Dremel tool I received last Christmas. I always wondered what those minuscule grinding tips could be used for that came with the Dremel kits. I thought, why not try and use one of those tips to mechanically to remove the finish from around the decal. This would enable me to avoid getting any stripper on the decal and thus ruin it. It worked perfectly! Be sure and use the steel bit with the tiny ball grinder tip.

I practiced grinding finish off a junk piece of wood before proceeding to the real thing. With a steady hand and a light touch on the surface, I was able to remove the old finish right up to the edge of the decal without grinding any of the decal away. I feathered out about two inches all the way around the decal. This is important because you need to completely cover the decal area (to protect the decal) when you use the chemical stripper on the rest of the cabinet. By using the highest speed and extremely light touch you can remove the finish and not grind grooves into the wood. That high speed drill will remove parts of decals in a heartbeat. Any light grooves left in the wood can be carefully sanded smooth by hand around the decal. Again, be careful with the sandpaper around the decal.

I then covered the now stripped decal area with cardboard held down with masking tape, being careful to be sure no tape was touching the decal. Then I proceeded chemically stripping the rest of the cabinet.I finished the project be re-staining the cabinet its original color and hand rubbing about four coats of tung oil. Tung oil gave the cabinet an original looking finish, leaving the grain of the wood somewhat open. New brass knob hardware, tarnished in vinegar for 48 hours put the finishing touch on the cabinet.

I know using a Dremel tool around a non replaceable decal sounds completely insane, but it worked perfectly! You really can't see where the chemical and mechanical stripping meet. The Sparton is now in our living room and looks quite original and well cared for.

Oh, it also sounds great too!



The "C" Supply will adjust from zero to approxmately 1.4 times the transformer voltage.

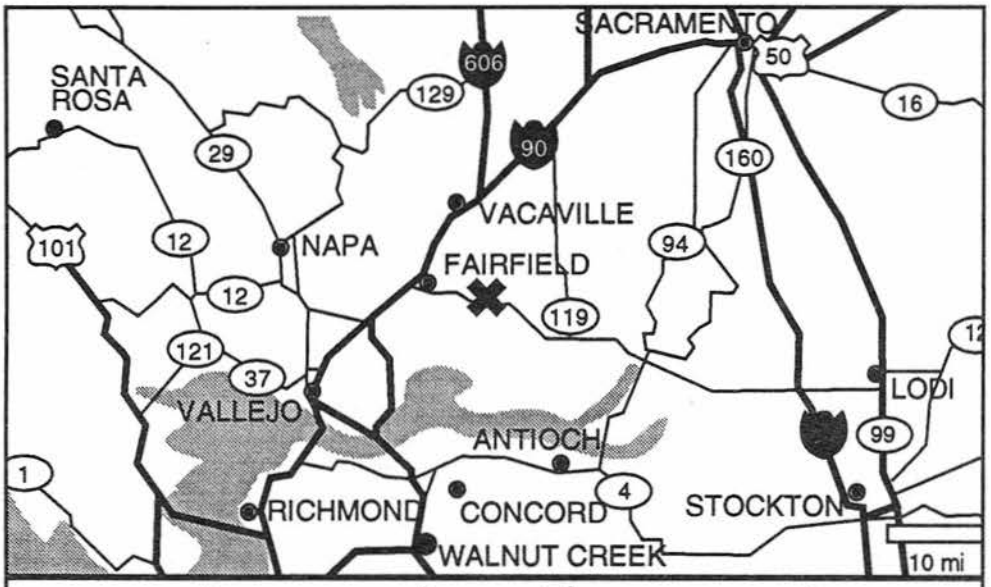
UPCOMING CHRS EVENTS

All events are subject to change or rain-out. For the most current information call 415 821-9800 (after Sept. 1).

September 14

Saturday, 8 am
5848 Highway 12,
between Rio Vista and Fairfield.
Western Railwoad Museum
Swapmeet and Picnic
Please pay park admission of $5

No sellers fee.
You must be a member to sell.

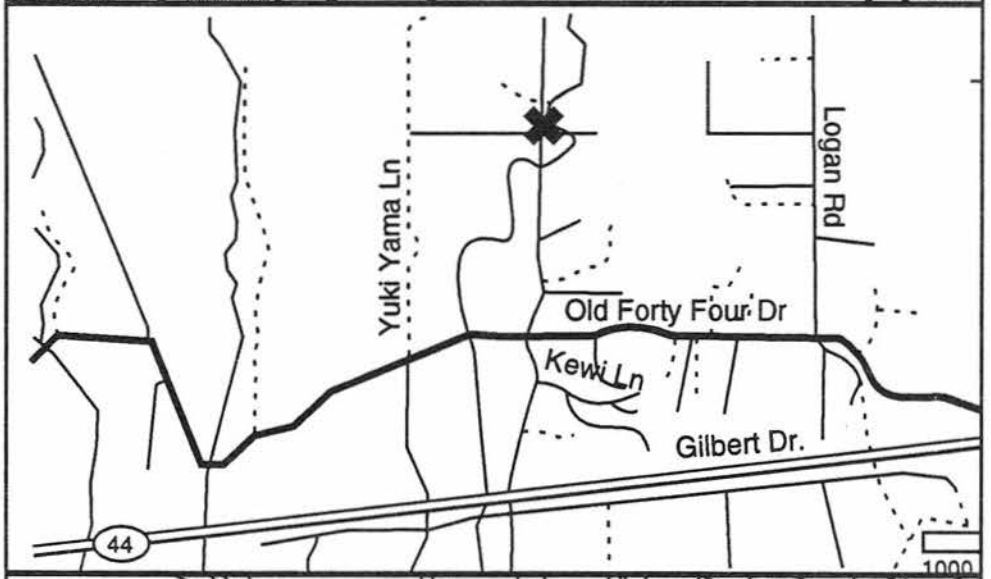


October 5

Saturday, 8 am
Highlander Dental Supply,
3035 Crossroads Dr., Redding

CHRS Northern California Chapter
Swap Meet

Sellers fee: $5
You must be a member to sell.



October 19

Saturday, 8 am
W. 13 Street & X Street, Merced

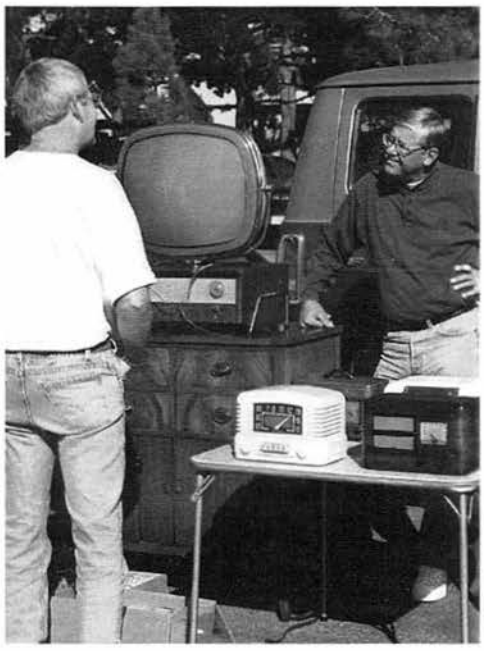
Swap Meet

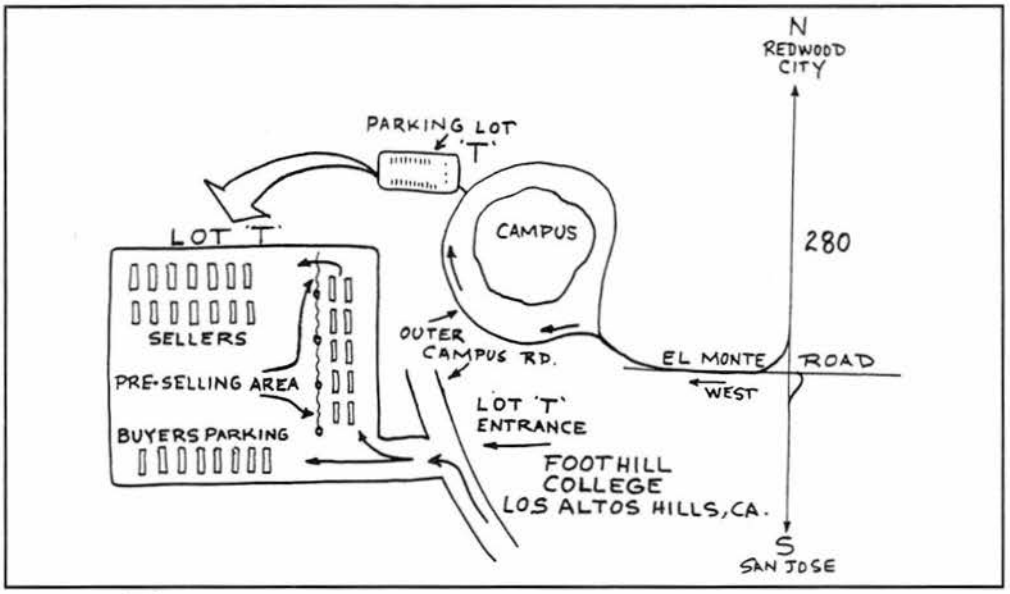
Sellers fee: $5
You must be a member to sell.

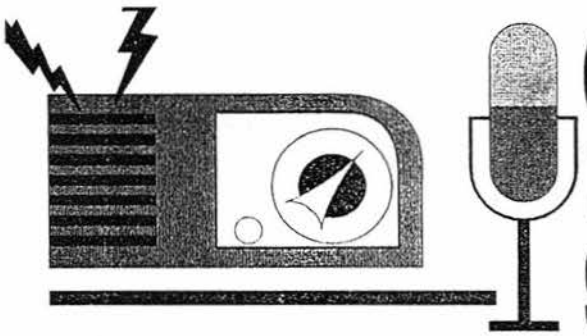
November 2

Saturday, 8 am
Los Altos Hills
Foothill College Swap Meet

Sellers fee: $5
You must be a member to sell.







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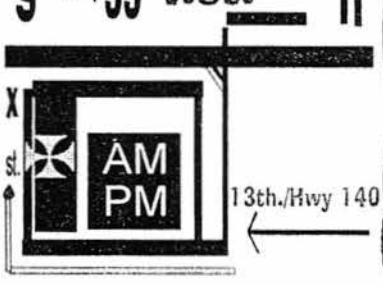

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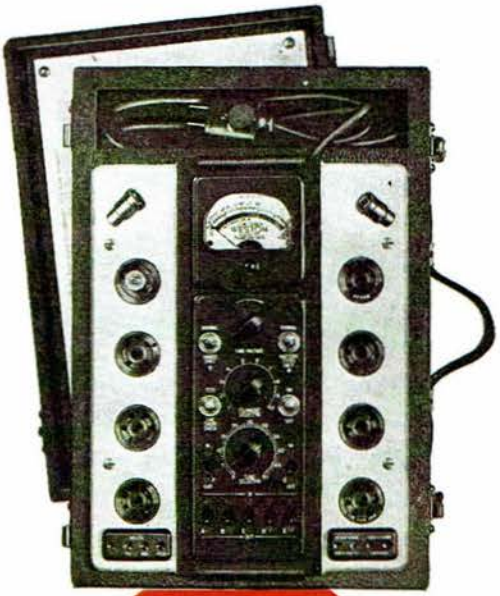

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