



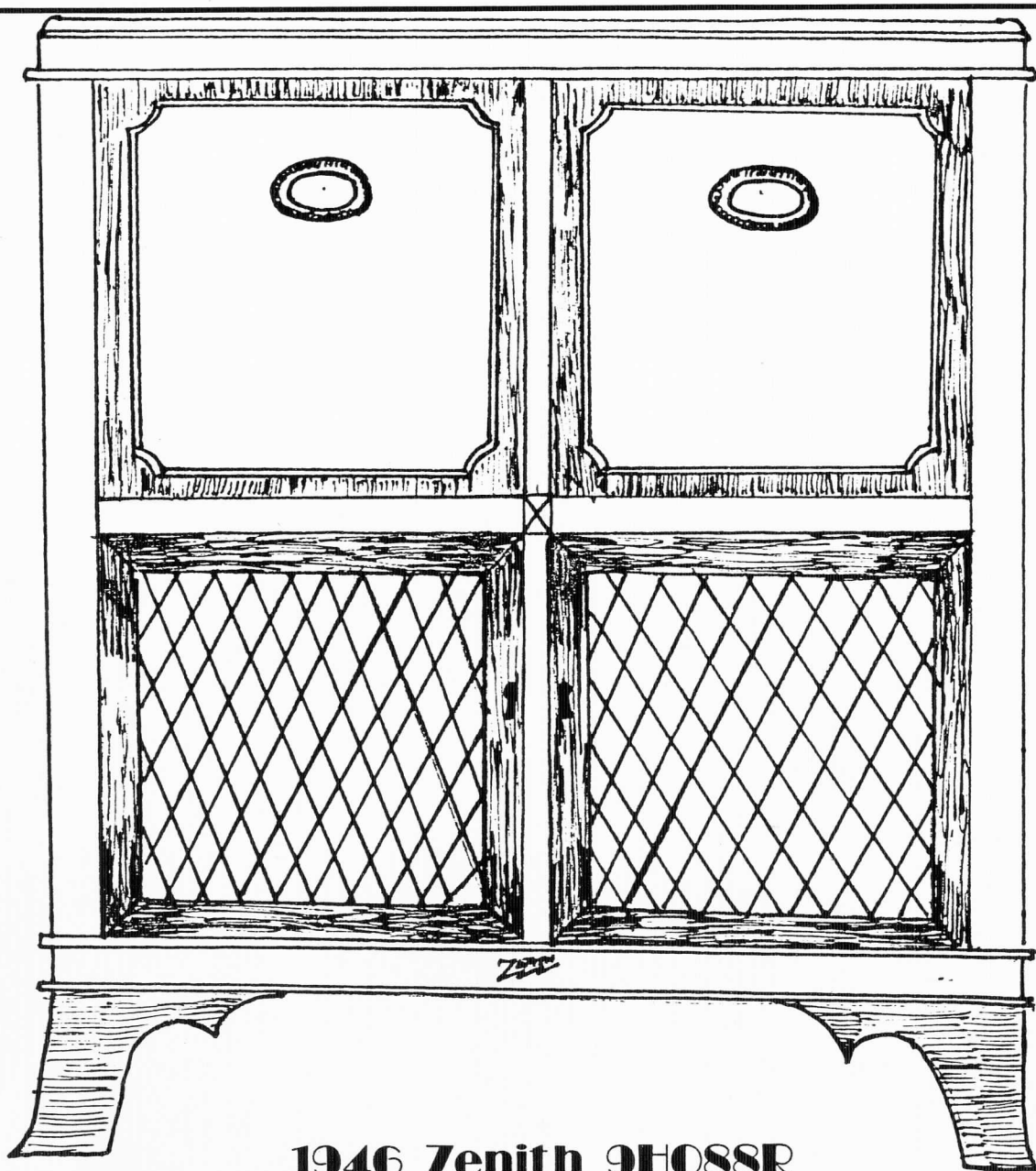
THE JOURNAL

OF THE
CALIFORNIA HISTORICAL RADIO SOCIETY

SPRING 1992

FOR THE RESTORATION AND PRESERVATION OF EARLY RADIO AND RADIO BROADCASTING

VOLUME 16, No. 2



1946 Zenith 9H088R

California Historical Radio Society

President

Jim McDowell
2265 Panoramic Drive
Concord, CA 94520-1316
(510) 676-2605

Secretary

Russ Turner
414 Liberty Street
San Francisco, CA 94114
(415) 824-8367

Treasurer, Appraiser

Will Jensby
645 Giannini Drive
Santa Clara, CA 95051
(408) 296-6071

Publicity and Public Relations

Mike Adams
112 Crescent Court
Scotts Valley, CA 95066
(408) 439-9544

Mailing Chairman

Dale Sanford
107 St. Thomas Way
Tiburon, CA 94920
(415) 435-6131

Vice President

Bart Lee
327 Filbert Steps
San Francisco, CA 94133
(415) 778-4072

Technical Advisor

Larry Clark
438 York Drive
Benicia, CA 94510
(707) 745-9132

Radio News (Tape) Editor

Bill Helander
4311 Miranda Ave.
Palo Alto, CA 94306
(415) 948-0972

Membership Secretary

Chris Buttery
71 Tenth Street
Oakland, CA 94607
(510) 839-6735

Board Chairman

Paul J. Bourbin
25 Greenview Court
San Francisco, CA 94131
(415) 648-8489

Board of Directors

Adam Schoolsky
38007 Stenhammer Drive
Fremont, CA 94536
(510) 791-0584

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

North Valley Chapter

Norm Braithwaite
P.O. Box 2443
Redding, CA 96099
(916) 246-4209

John Wentzel
1609 Irving Street
San Francisco, CA 94122
(415) 731-1920

Journal Co-Editors: Adam Schoolsky, Bart Lee

ON THE COVER: *Featured Set: The 1946 Zenith 9H088R Combination Radio/Phonograph.*

MEETINGS and SWAP MEETS: CHRS meetings are held 2-3 times per year. Locations are announced in CHRS publications and by mail. Swap meets are in February, May, August, and November at Ampex Corporation in Redwood City. Regional meets at various Northern California locations are conducted from time to time. Contact the Public Relations Director if you want to sponsor a swap meet in your area.



ABOUT CHRS

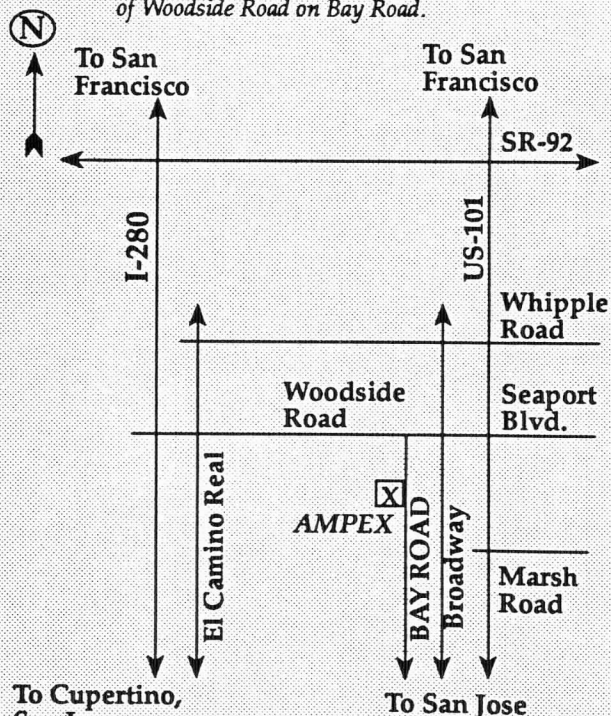
The California Historical Radio Society is a non-profit corporation chartered in the State of California, and was formed to promote the restoration and preservation of early radio and broadcasting. Our goal is to provide the opportunity to exchange ideas and information on the history of radio, particularly in the West, with emphasis in the areas such as: collecting, literature, programs, and restoration of early equipment. The *Journal* of the CHRS is published quarterly, alternately in printed and audio tape format, and is furnished free of charge to members. Yearly membership dues are \$15.00 (US funds, please).

Submissions for the *Journal* are always welcome. Typewritten copy is preferred. Articles submitted on 3.5 inch IBM or Macintosh diskettes in ASCII or Microsoft Word are appreciated. Send all material to the editor and include your name, address and phone number.

The *Journal*, copyright © 1992 by the California Historical Radio Society. All rights reserved. No part of this publication may be reproduced in any form, or by any means, without prior written permission from CHRS.

Map to AMPEX Corp. Swap Meet

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



PRESIDENTS MESSAGE

THE AMPEX MEET WAS VERY ENJOYABLE AND WE HAD ONLY ONE PROBLEM, PEOPLE ARRIVING BEFORE EIGHT-THIRTY A.M. AMPEX HAS SET OUR STARTING TIME AND NO ONE, INCLUDING MYSELF IS WELCOME ANY EARLIER. PEOPLE WHO SHOW UP BEFORE JEOPARDIZE THE CLUBS STANDING WITH AMPEX. WE DO NOT WANT TO LOSE A VERY NICE MEETING PLACE. I HOPE THE RECESSION IS OVER, AS MY OWN BUSINESS HAS BEEN VERY GOOD, IT USUALLY IS SLOW AT TAX TIME. I WOULD LIKE TO THANK MIKE QUINNS SURPLUS FOR HOSTING THE MARCH SWAP MEET AND THANKS TO RUSS TURNER FOR SETTING IT UP.

THE WANT ADS ARE FREE!! I WOULD LIKE TO SEE MORE WANT ADS IN OUR PUBLICATIONS. PLEASE FEEL FREE TO CALL AN AD IN TO ME,

THE ANNUAL C.H.R.S. PICNIC WILL BE ON SUNDAY MAY THE TENTH. PLEASE COME IF YOU CAN, AND BRING ANYONE YOU WISH. ALSO BRING ANY TYPE OF BATTERY OPERATED RADIOS WITH YOU. V.H.F. RECEPTION IS VERY GOOD AT THE OWL CAMPSITE, SO YOU HAMS WITH TWO METER HAND HELD RIGS CAN HAVE A LOT OF FUN ALSO.

SEE YOU AT THE MEETS

COMING EVENTS...

JIM

2 May—CHRS swap-meet at Ampex, Redwood City, CA. Official starting time is 8:30 AM. Please do not arrive before the above time.

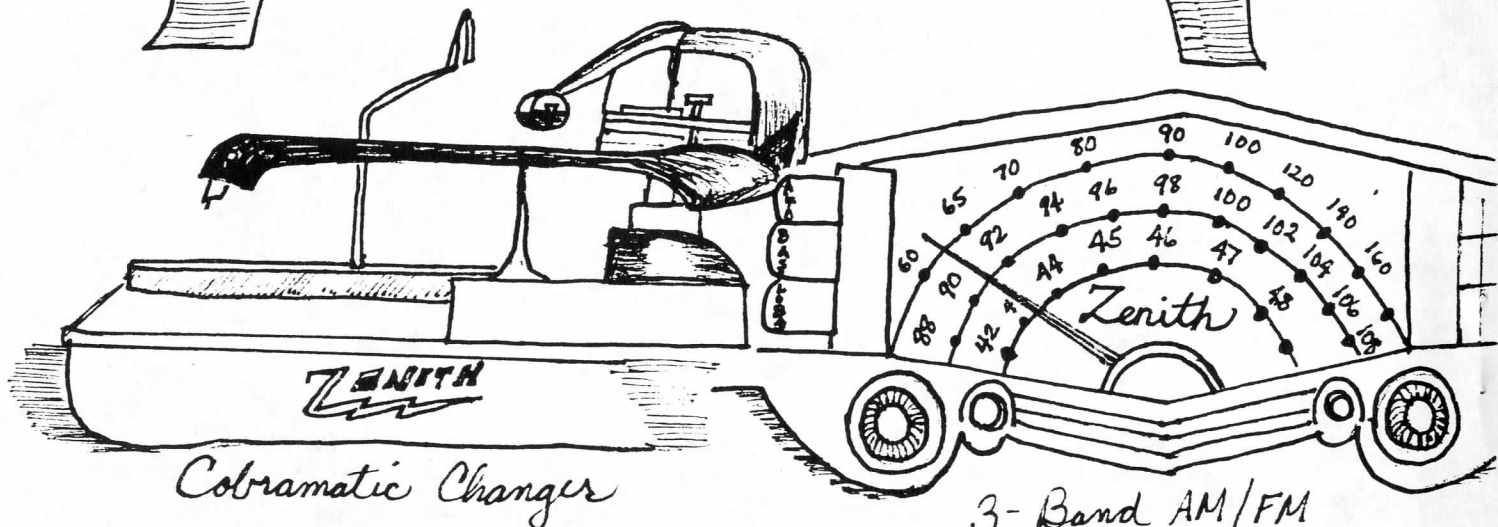
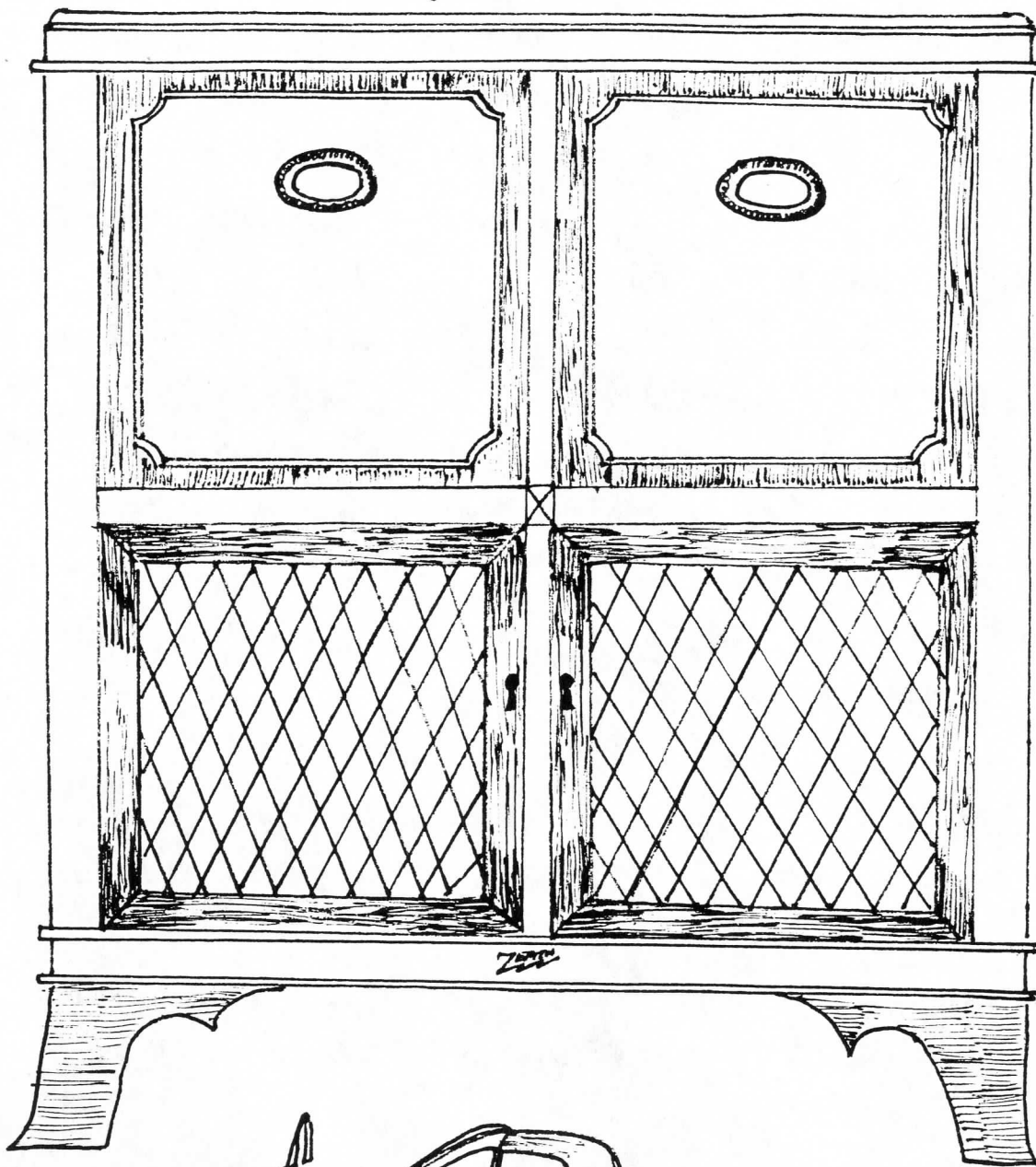
9 May—CHRS Third Annual Picnic. Bring food, family and battery powered radios to Owl Campsite, Tilden Regional Park, Berkeley, CA (same location as in previous years). This event has always been a lot of fun for members and their families and friends. This location has nice facilities and is in one of the best RF locations in the Bay Area. It gives members a chance to socialize and experience the fun of doing that which radios were designed for; to be played.

For more information and directions, call Jim McDowell (510) 676-4209 or (707) 746-5557. [ed]

ZENITH

(1946)

Model
9H088R



Cobramatic Changer

3-Band AM/FM
Radio

Chris J. Battery 4-18-92

FEATURED SET
The ZENITH model 9H088R
Radio-Phonograph (1946)

By Chris J. BATTERY

A set which I bought last October, that has become a great favorite of mine is the Zenith Radio Phonograph Combination model 9H088R, from 1946. This is one of Zenith's early post-war models. It holds a unique place in my collection. Out of some 28 radios, (16 of which are console models) only 4 are of post-1945 vintage. The Zenith fits into the same category as my 1948 Emerson (model 563), or my 1955 Packard-Bell (model 11RP2). Both are AM/FM radio-phono combinations. And last, but not least, and probably most important, is my 1958 Stromberg-Carlson Stereo Radio-Phono combination (model SP-984-T) which was one of the last Strombergs made. This set may be the topic of a future article.

The Zenith is housed in what could be called a horizontal type console cabinet, which is typical for the post-war era. But the same chassis, speaker and record changer was fitted into upright cabinets as well, with the radio dial facing upwards and the chassis mounted vertically. Zenith models 9H081 and 9H079, as seen in Sam's Photofacts from 1946 are equally attractive examples, but minus the record storage space.

Returning to the model 9H088R, it is unique for several reasons. Its chassis is also mounted vertically, but the radio dial face can be hidden and closed up in the cabinet. The radio, in order to be used, swings out of the cabinet at an angle, which makes the dial face easily readable from just about any position. The controls are also easily within reach, which does not require the operator to stoop. The set is a 3-band 9 tube set with of course the AM band and both the old 45 MC FM band, as well as the modern 100 MC FM band. It was probably one of the first Zeniths of this type. Concerning the record changer, this was also the first year that Zenith abandoned installation of the Oak changers, it so heavily relied upon on its pre-war combinations. In 1946, Zenith introduced its own line of changers, which were all nothing short of excellent. Two models I've run into are the # S-11680 and the # S-14010, which both had elaborate solenoid trip changing mechanisms. These not only made Zenith phonographs more reliable, but with the introduction of the Cobna tone-arm, diamond stylus, and Radionic pick-up, made record playing far more enjoyable. The records played on them did not wear nearly as quickly as on the older equipment. For the first time, through this innovations, record reproduction began to approach the level of high-fidelity.

The radio itself, is an eight tube superheterodyne, (excluding the phono osc tube 7F7) with a single ended output. The tube line up on this model consists of one miniature; 6AG5, for the R F; the rest are standard octals: 6BS7, for the converter; 6SG7 for the first I F; 6SH7, for the second I F; 6SH7, for the limiter; 6S8 GT, for the discriminator and first audio; 6K6 GT, for the audio output and a 5Y3 rectifier. The set uses a 12" permanent magnet speaker. However the early version of this chassis may have included a field coil type speaker, since on my set it has the unusual feature of having a power resistor enclosed in a metal box, mounted on top of the speaker.

Restored the set is extremely sensitive on all bands, In fact, on the FM band, I had to disconnect the set's built-in antenna, since the strong signals here in Oakland caused the set to overload and distort badly. The AM band has the famous Zenith Wave-Magnet, concealed in the set's speaker compartment and can be rotated for best reception. The radio also includes Zenith's famous Radiorgan, which was introduced on the pre-war console sets. The Radiorgan was a unique type of tone control only found on Zenith sets. It was in essence, a very early sort of graphic equalizer, which was greatly responsible for Zenith's excellent tone quality. This feature was without peer on the radio market in 1946.

The record changer was probably one of the best designed 78 RPM changers I've seen. The pick-up containing a diamond stylus only weighs 14 grams, and subjects the records to minimal wear. The changer can accommodate easily as many as fifteen 10" discs, or twelve 12" discs, or twelve 10 and 12 inch discs intermixed. The model # S-11680 repeats the last record on the stack, while the model # S-14010, of 1948, shuts off after the last record has finished. This later model also has the ability to play 33 1/3 RPM discs manually with a separate tone arm that weighs less than 4 grams. Both changers are electrically identical. The Cobramatic changer has a solenoid trip changing mechanism, which will not only play just about any electrically recorded record even made, in spite of the differences in run off grooves between makes, (some changers would not play certain makes of records automatically, especially the pre-1932 Victor) but the set being electronically activated, has a reject button on the face of the radio panel. It is no longer necessary to open the record player compartment to reject a record.

Probably the most important innovations regarding this new series of Zenith Cobnamatic changers, is the completely new type of electronic pick-up it employed. Instead of using a crystal or magnetic system which generates a voltage, the Cobra Radionic pick-up controls the power supplied by the oscillator section of the 7F7 tube used in the phono pre-amp. In Sam's 1947 Automatic Record Changer Service Manual--Volume 1, it states, "....a coil located in the pick-up cartridge is part of the tuned circuit of the oscillator. A stainless steel vane, part of the stylus assembly, moves in front of the coil in response to the modulation on the phonograph record and varies the Q of the coil. This causes changes in the amplitude of oscillation, these changes are detected and amplified in the pre-amp and are passed on to the audio amplifier. The oscillator frequency used in this case is approximately 2.5 mc."

This stroke of genius was to be seen on most of Zenith's record playing equipment for the next 12 years until 1958, when stereo records were introduced. On the post 1958 Zenith Stereophonic phonographs, the Cobra tone arm was retained, and a ceramic stereo cartridge was fitted into the headshell, thus abandoning the radionic system that worked so well.

In conclusion, the Zenith 9#088R is unique, not only for its technical innovations, but it helped set new standards for Zenith radio-phonographs for at least the next decade.

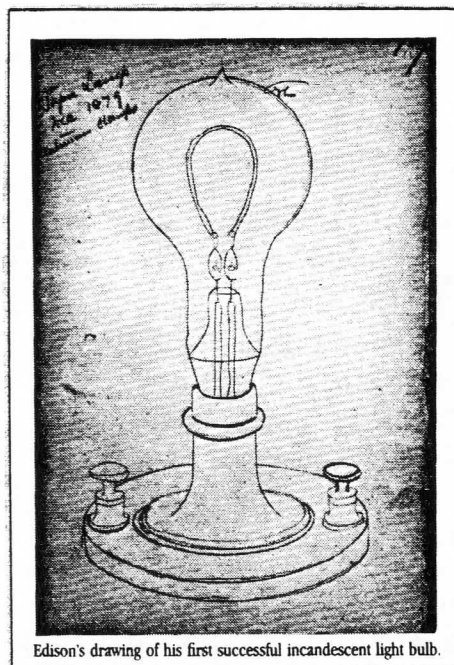
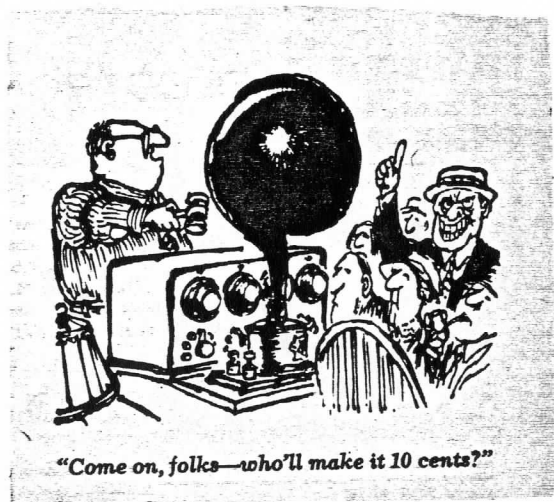
♠ WILL JENSBY WINS AWA BLUE RIBBON ♠

Will Jensby, WØOEM, CHRS, entered a deForest Spade Detector in the Antique Wireless Association displays at the annual AWA convention in September, '91 at Rochester, NY. AWA awarded him the Blue Ribbon for First Place in Category 8, Detectors. Lee deForest "invented" the spade detector before he invented the Audion in 1906. The spade detector used an electrolytic process and a platinum surface, but so did Reginald Fessenden's electrolytic detector, which he had patented. Fessenden eventually won a patent suit against deForest, but by that time, deForest had moved on to the Audion and broadcasting. Jensby's spade detector must be one of the very few outside of museums. It is very well preserved and thought provoking, as well as historically important ♠ [BL]

IT ONLY TAKES ONE PERSON TO RUIN IT FOR EVERYONE (HERE WE GO AGAIN...)

By: Paul Joseph Bourbin

At the last meet at Ampex, a problem occurred in that people arrived early in violation of the agreement with Ampex. Ampex is supplying us with a very nice location for our meets, gratis, free, no charge. One of the few requirements is that we do not start before the stated time. If we are unable to follow their rules, we will not be able to have meets there. Most of those who arrived early, cooperated and left until the official starting time. I have no quarrel with those people. However, some people refused to wait and insisted upon staying, even though nothing was happening. Ampex does not like people loitering on their private property for security reasons. I realize that many of those who stayed were camp followers who are not members and therefore do not receive all of the information, but members or not, their selfish, actions will ruin it for for the rest of us. On this upcoming meet, PLEASE wait until the official starting time and please tell your "guests" to do the same. Since the meets are the only interest for the majority of our members, please do not do anything to give Ampex cause to cancel the remaining meets. Those of you who have difficulty curbing your lust and are suffering from insomnia, drive by. When you see nothing is happening, go to Denny's down the street and have a cup of coffee; the stuff will still be there when you return. Think of those who worked with Ampex to get this fine location. We do not want to besmirch our good name.



HISTORY OF BROADCASTING IN THE BAY AREA

Part I: KALW - FM

42.1 MEGACYCLES 1941

by Mike Adams
Special to CHRS Journal

- ◆ The first FM station in San Francisco.
- ◆ The first educational FM station in the United States.
- ◆ The first licensed non-commercial FM station west of the Mississippi, and
- ◆ The second FM station in the nation.

These distinctions belong to KALW-FM, the high-class public radio outlet owned and operated by the San Francisco Unified School District.

According to the station publication, "KALW: 50 YEARS OF PIONEERING RADIO SERVICE," the station's roots go back to a demonstration FM station which was on display at the 1939-40 San Francisco International Exposition at Treasure Island. The demonstration apparently grabbed the attention of two district teachers who saw the long-term benefits of education by radio. Kenneth Nielsen, an electronics engineer, and Ken Dragoo, both taught radio at the Samuel Gompers Trades School at 23rd and Bartlett Streets in the Mission District.

They created a plan by which they could use a real radio station as a "teaching aid" and applied to the Federal Communications Commission, for an FM channel. The School District provided the funding.

The FCC granted the District a frequency of 39.7 megacycles and later changed it to 42.1 megacycles. In 1940 RCA lost the proposed TV channel one (42-50 megacycles) when the FCC gave it to Armstrong for FM. The equipment, purchased from RCA, was the same transmitter that had been on display at the International Exposition.

The station went on the air officially at 9 AM on Monday, March 10, 1941, broad-casting from the fourth floor of the Samuel Gompers Trades School. The school offered classes in radio engineering, operation and announcing.

To put the history of KALW-FM in perspective, consider the twin plights of FM as a future radio service and the state of educational radio in general in the 1930's. The FM story begins as the much-maligned inventor Major Edwin Howard Armstrong demonstrates his system at a meeting of the Institute of Radio Engineers (IRE) in November 1935. Patented and field-tested during the early 1930s, the Armstrong FM invention really impressed the assembled engineers with its clarity and freedom from static.

Clearer heads would have immediately dumped AM for the superior FM, but with big dollars invested in AM, with RCA pushing for

electronic television, and with millions of AM sets in use, FM would pushed into the background where it would not emerge as a serious player until the 1970s. Give it to the educators, some said. The money was in AM, the future was in television. Armstrong and FM battled against RCA and TV for frequency allocations between 1938-1948 (See Mike Adams, "The Device that Defined a Decade," ARC, 7:6, pp 4-7, and generally Tom Lewis, EMPIRE OF THE AIR (1991)).

Educational radio had already lost the battle to big business, the AM business. Sure, some of the very first radio stations were built and operated by colleges and universities. But in the 1920's as those few frequencies allocated to broadcasting became overcrowded and as technical standards changed, most of the original educational AMs were taken over, bought out, actually overwhelmed and shoved aside for the emerging commercial giants.

Even though the Federal Radio Commission and later the FCC extracted promises from commercial licensees that they would provide time for educational programming, it was usually the time they couldn't sell; 5 AM Sunday morning was a popular time for educational programs. Educators would have to wait to make their comeback as radio broadcasters.

In 1949, as a result of pressure by educators, the FCC finally reserved 88.1 through 91.9 Mhz for educational, non-commercial use.

In this period, the KALW-FM station certainly lived up to the goals of

its founders as it provided unique training in broadcasting continuously between 1941 and 1971. In the 1950s, it was said that most of the radio and TV engineers working in commercial broadcasting in Northern California had been trained at the KALW facilities. In 1953, the station's transmitter and studio equipment was moved to the John O'Connell School at 21st and Harrison Streets in the Mission where the FCC authorized it to broadcast at 91.7 megacycles. This was in what was then called the "new FM band." KALW remains on this channel today.

In 1954, the television training facilities at the station became the first broadcast studios of KQED-TV. The KALW-FM staff and students in the training program were considered an important part of the KQED operation until it got its own facility in 1956.

KALW-FM ceased its training of broadcasting students in 1971 when the San Francisco Board of Education qualified it as an affiliate of National Public Radio, NPR. In 1975, the station purchased a new transmitter and moved it to Twin Peaks for greater coverage. Today, KALW-FM is a respected community and educational station serving San Francisco with both local and NPR cultural and public affairs programming. It is a pioneering station with a proud history.

*Thanks to KALW-FM General Manager
Daniel del Solar, who furnished station
historical information
for this story. ##*

RESTORATION TIPS for the
MAJESTIC model 71-B RECEIVER
By Chris J. Buttery

I recently acquired a Majestic 71-B receiver, where I was quite fortunate that the cabinet's condition is excellent. However, as one might have guessed, the receiver did not play when plugged in. The dealer was upfront and told me about it before I decided to buy it, so there was no harm done and I was proud of my new set. Now, I'm even more proud, since I successfully was able to get the set going--being the first project I tackled totally on my own. Regarding the history of the set, this was not the model that Majestic scooped the radio industry with in 1928, (where their total output peaked 4000 sets a day!), but this was their mid-season model introduced in January 1929. Both the 71 and 71-B have basically the same chassis, power supply and speaker with minor modifications. The 71 was housed in a typical highboy cabinet of the period. The set I obtained is contained in a very attractive lowboy cabinet. The most noticeable change on the chassis is the position of the control shafts, which are spaced closer together to accommodate the newer cabinet. Also a resistor was added to the power supply.

The main problem with the Majestic products of this period, models 60, 61, 71, 71-B, 72 and 181 radio-phonograph combination, is that they all had separate power supply units which were tied to the radio chassis with a wire harness, in which the plastic wires have deteriorated over the period of some 60 years. The plastic insulation on these wires has cracked to the point where they can cause serious shorting problems with the set. It is in the best interest for the set's preservation (if it is to be played) to completely replace the wiring harness with one you can easily make on your own.

As soon as I got my set home, I removed both chassis and the speaker. I began cleaning them, and began to form the new wire harness. Approximately 60 to 75 feet of 18 or 20 gauge stranded wire is sufficient for this project. Plan to spend a good part of a long evening to work at a comfortable pace. It is also advisable that this time should be void of distractions, to prevent miswiring.

Begin by disconnecting each lead individually, starting at the terminal board on the underside of the radio chassis. Replace the old lead with a 3 to 4 foot strand of wire. I've found that it's best to solder the lead there first, then

run it to the terminal card where the other end is soldered. The weight of the chassis will help you in later braiding the wire, since it can be pulled and kept taught. After the first lead has been soldered in place, simply twist each additional lead around the previous one laid, in order to form the new harness. There are a total of 12 leads for the set. For those who get confused with the connections, or are missing the original wire harness, or if it has become disconnected from the terminal card, use the wiring guide in figures 1A and 1B to help you with the connections. Once the wiring harness is completed, put aside the chassis and take a breather. The next step is to completely wire the power supply and you may want to attempt that project on a different day.

Remove the power supply's cover and you will notice that it is made up of 4 sections within the housing: the filament transformer, the B+ transformer, the filter choke and the filter capacitor pack. All units can be removed individually, if necessary. Replace each lead with a new wire, and remove them individually to avoid confusion with the wiring. (See figure 2 for layout of the terminals on the power supply) It will be necessary to remove the terminal strip on the top of the power supply to have access to the wiring underneath.

Examine the filter pack for leaking tan, since this may be an indication of shorting filters that overheat when the set is on. Even if the filter pack looks alright, it may be a good idea replace the capacitors, to prevent possible damage to your power supply in the event one shorts.

There are no floating grounds in the circuit and the caps are easy to replace in a set of this vintage. Loosen the bolts on the right side of the power supply housing. Then remove the leads, making note of their positions. The top terminal is the common ground for all 4 filters in the pack and can be connected as shown in figure 2. Remove the filter pack, it should just slide out. Bend the metal edge of the pack outward, so that the cardboard with the terminals on it can be removed. There should be enough space to insert new filter caps without melting out any tan, once the original leads are removed. Once the filters are in place, (I used four 10 mfd at 450 volts) and terminals are securely soldered, the pack can be closed up and reinserted into the housing. Reconnect it back into the circuit. Once this has been completed, I'd suggest a careful examination of the speaker leads. If in poor condition, also replace.

Before plugging in that power supply, make note of the following warning----NEVER UNDER ANY CIRCUMSTANCES, IS THE POWER SUPPLY TO BE OPERATED, OR PLUGGED IN WITHOUT THE CHASSIS AND SPEAKER CONNECTED TO IT. WITHOUT THE LOAD, THE B VOLTAGES WILL BE UNUSUALLY HIGH (SOMETIMES IN EXCESS OF 500 VOLTS) AND WILL LITERALLY BLOW UP YOUR FILTER

CAPACITORS!!!--the author knows this all too well from experience!

FIGURE 1B

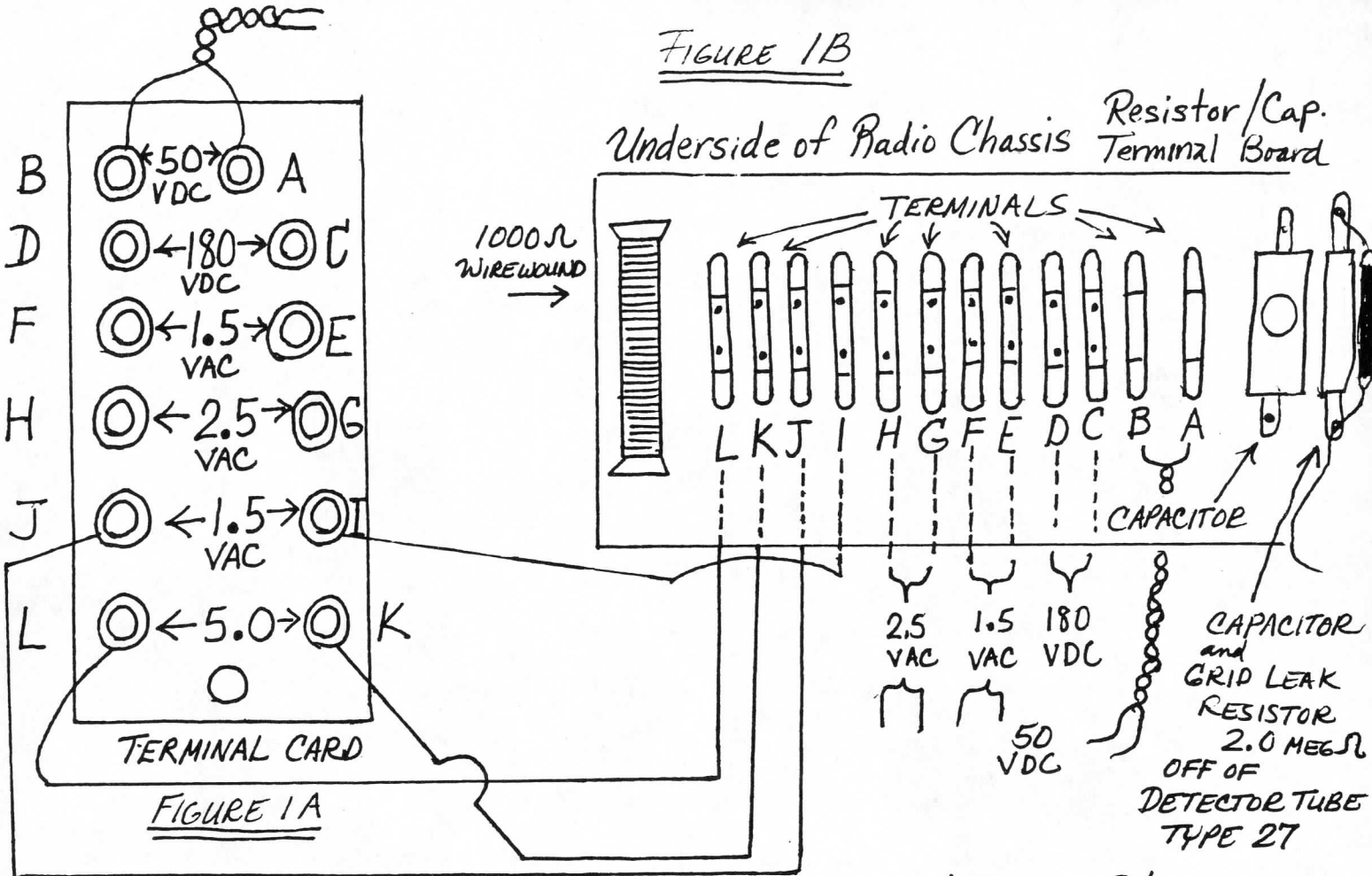
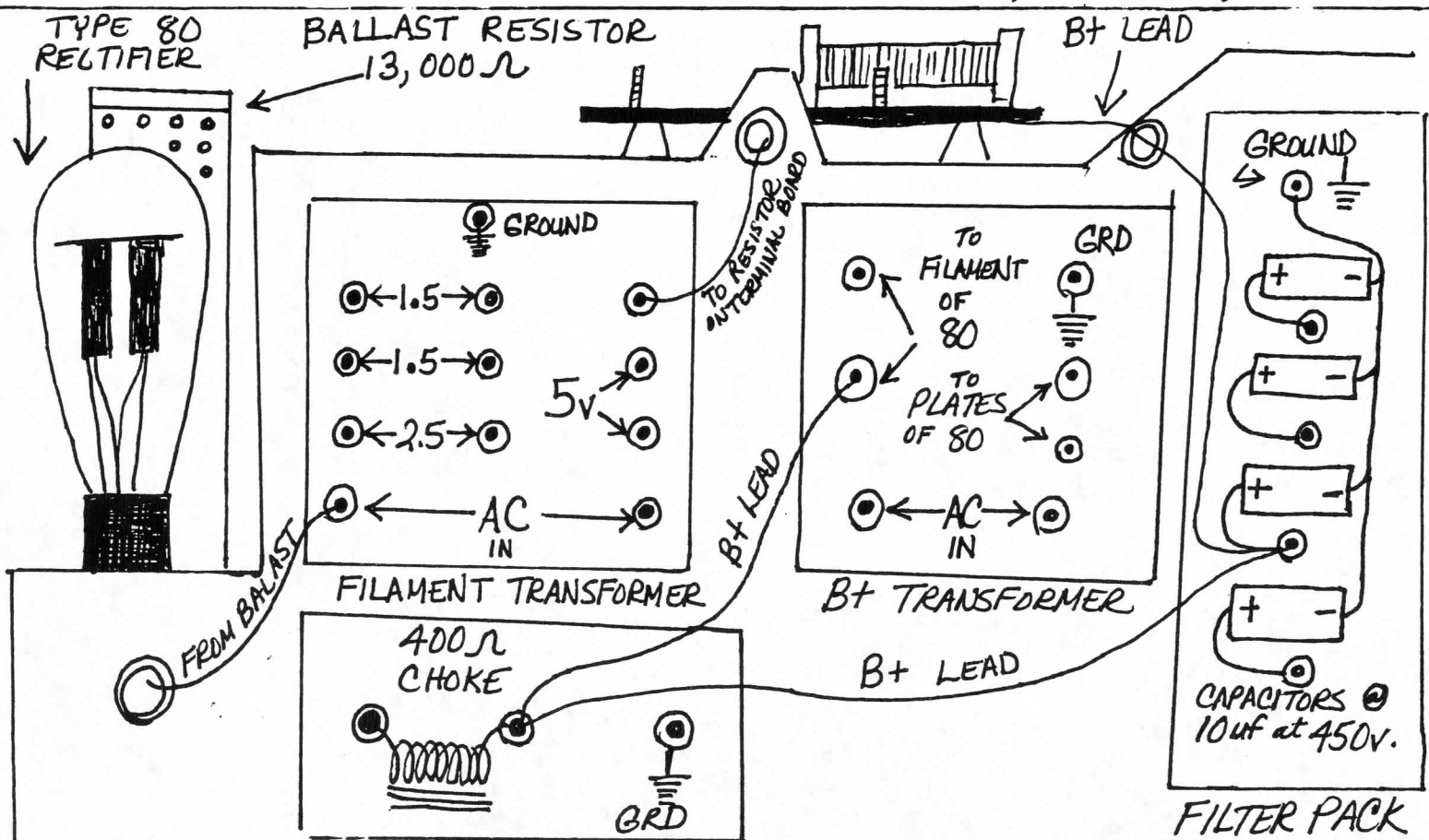


FIGURE 2

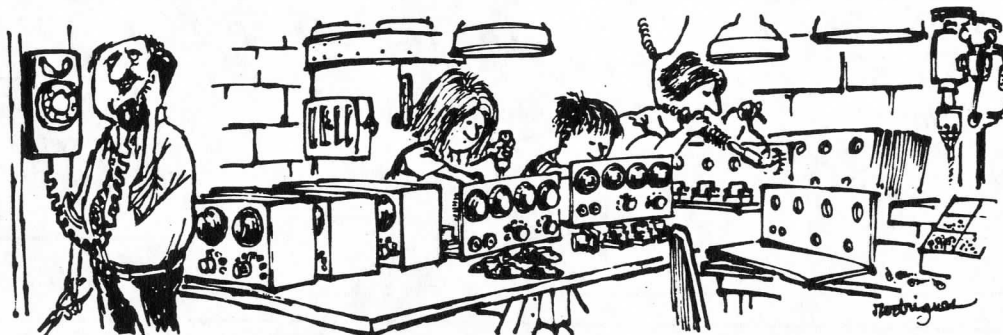


SIDE VIEW OF POWER SUPPLY (WITHOUT WIRING, EXCEPT B+ LEAD)
FOR CHASSIS - 70 or 70B

If you've powered up your set and there is no sound, and everything appears normal, you probably have an open wire-wound resistor, located on the top of the power supply. There are three of them, and they have a notorious history of failing. The one I replaced in my set is the 1000 ohm one. There are also a 2300 ohm resistor as well as a 15,000 ohm one. If your set happens to be a later version, there will be a fourth resistor with the value of 1000 ohms. These can be replaced with 25 watt wire-wounds. If this fails to bring sound to your set, and your voltages seem normal, (check them against figure 1A on the terminal card) you may have an open audio transformer.

If the set operates, but seriously distorts, check the grid-leak resistor off of the detector tube (type 27), located on the radio chassis resistor/terminal board in figure 1B, on the extreme right. It may have changed significantly in value or opened up completely, thus not creating enough bias for the 71-A output tubes. A 2.0 meg ohm resistor should cure this ailment.

Fortunately I was able to get my Majestic model 71-B to operate well without any complications. So far I've enjoyed playing the set tremendously. It has ample power and good tone for this early of an AC operated set. For a T R F set, the selectivity is quite outstanding. I'm able to separate KDFC @ 1220 KC, a classical station which is sandwiched between two rather strong stations. Some of my better superhets have difficulty receiving that station. On the Majestic, though, it plays loud and clear with minimal interference. If that isn't the acid test for how well a T R F set performs in this air-wave congested area, I don't know what else is!!!



"Yes, this is the party that advertised a 1922 radio for sale."

FOR SURPLUS HOUNDS

by Bart Lee, xWPE2DLT
327 Filbert Steps
San Francisco, CA 94133
(415) 788 - 4072

*Special thanks to
John Wentzel and
Henry Engstrom*

THE BC-1206

The BC-1206 is one of the simplest radios ever made for a military organization. In World War II it was the A-N beacon receiver, telling ferry and other pilots where they were relative to airfields. It is a superhet long-wave set designed for the primary purpose of permitting a pilot to listen to a homing beacon. Weather broadcasts also went out VLF in those days, and after WW II, for the benefit of fliers. According to Henry Engstrom, these pilots often had no other radio aboard.

There were at least two versions of the BC-1206. The first was the Signal Corps set (this one a BC-1206-B) pictured on the left. It is about 2" shorter than the Setchel Carson BC-1206-C, pictured on the right. The Signal Corps set uses metal and glass octal tubes and the later version uses glass loctal types. Setchel Carson (of St. Paul Minn., and others, e.g. Electronic Specialty Company of Los Angeles) may well have continued to make the BC-1206-D (and by that nomenclature) for some time after the War, as civilian aviation took off (as it

were) in small planes. The A-N beacon system continued in use at many airports well into the 1960s.

The beacons sounded like a Morse code A from one direction and a Morse code N from the other: dah dit or dit dah. After the war, many of these long wave beacons sent a one letter Morse identifier, with AM voice weather broadcasts between two and five times every hour, known as the Airway Weather Reports. In Northern California the station was KCV on 242 kilocycles with weather for Oakland at 30 minutes after the hour, and for the coast and south and east at 50 minutes after, and north at 55 minutes after. In Los Angeles, the station was KCT at 260 kilocycles, five times an hour, with weather East as far as Salt Lake City and North to San Francisco.

The radio slid into a hole (4+" by 4+") on the dash panel of the aircraft, and the pilot often took it out with him (or her) after a ferry run, so it could be recycled. (Many WW II ferry pilots were women civilians, freeing men for combat flying). The Signal Corps version pictured here bears a legend on the faceplate: NOT TO BE REMOVED BY THE FERRY PILOT OR OTHERS EXCEPT ON THE INSTRUCTIONS OF THE COMMANDER. (It also bears a 1943 "CWF" contract number, probably the Setchel Carson contract identifier).

The BC 1206 operates on 28 volts straight from the aircraft's utility system, for both A and B voltage for the six tubes (see the page from the manual, reproduced here). Many of the tubes of that era worked fine on such a low voltage, but each tube could vary so they had to be tested. (Many of the

ELECTRICAL SPECIFICATIONS

Tube Complement	14H7 — RF amplifier 14J7 — Mixer 14H7 — IF amplifier 14R7 — Detector - 1st audio 28D7 — Output amplifier
Frequency Range	195 KC to 420 KC
IF Frequency	135 KC
Receiver Sensitivity	3 Microvolts for 10 Milliwatts output.
Fidelity	Within \pm 4DB from 200 to 1000 CPS. At least —15DB at 5000 CPS.
Output Impedance	300 Ohms and 4000 Ohms to be selected internally.
Power Output	250 Milliwatts
Volume Control	RF Gain Control
Power Supply	24 - 28 Volts Aeroplane Battery
Current	75 Amperes

Page 1

MECHANICAL SPECIFICATIONS

Height	4"
Width	4"
Length	6 $\frac{5}{8}$ "
Total Weight	3 pounds, 14 ounces

GENERAL DESCRIPTION

The 524 Receiver is a small sized, light weight aircraft receiver covering the frequencies from 195 KC to 420 KC. The use of a superheterodyne circuit provides good sensitivity with ample selectivity.

A very desirable feature is that this receiver operates directly from 28 volts which is supplied from the aeroplane battery. No vibrators, motor generators or power packs are necessary as 28 volts is all that is required for "A," "B" and "C" supply. Due to the highly efficient input circuit, the antenna capacity is not critical within wide limits.

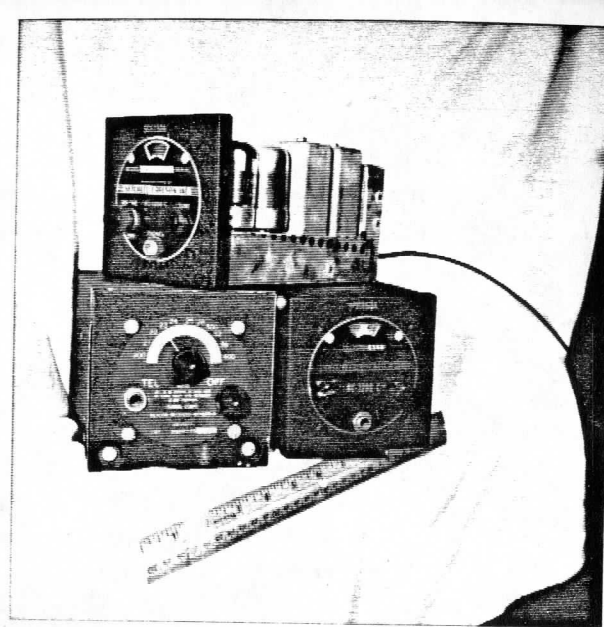
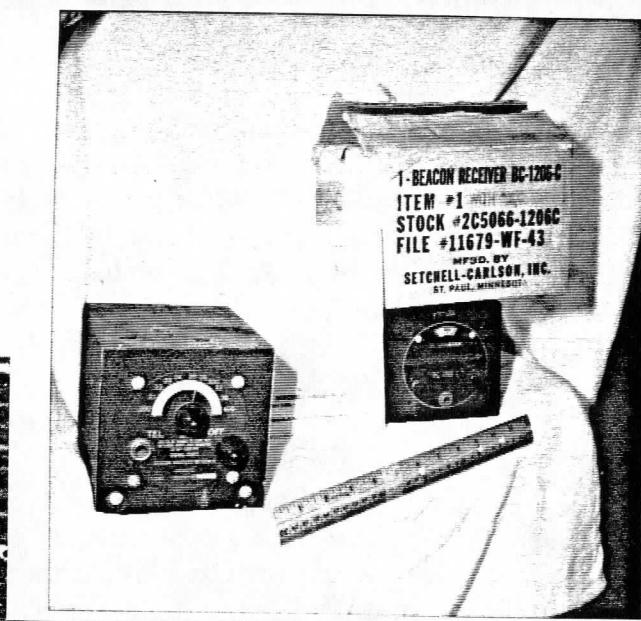
DESCRIPTION OF ELECTRICAL CIRCUITS

A conventional superheterodyne circuit is employed in the Model 524 and is arranged so that AVC will prevent overloading on strong signals.

The manual volume control is in the cathode circuits of the RF and IF tubes and controls the gain of the receiver.

A tuned antenna stage is fed into the first RF amplifier (14H7). This tube is coupled to the mixer tube (14J7) by a high impedance plate winding and a tuned secondary or grid winding. The oscillator section of this mixer tube is tuned by gang No. 3 in conjunction with the oscillator coil. The pentode plate of this mixer tube is connected to the primary of the first IF transformer. The tuned secondary of this transformer is connected to the grid of the IF amplifier (14H7). The plate of this tube is connected to the tuned primary of the second IF transformer. The tuned secondary is connected to the diodes of the second detector (14R7). The audio voltage developed in this detector circuit is coupled through a condenser to the grid of the pentode section of this 14R7 tube. The plate of this 14R7 is coupled through a condenser to the grids of the 28D7 output tube. The cathodes of this output tube are grounded. The proper bias voltage is supplied to the grids of this output tube through a resistor from the oscillator section of the 14J7 tube. The plates of the output tube are connected to the primary of the output transformer. This output transformer has two load impedances, namely, 300 ohms and 4000 ohms.

Page 2



RADIO RECEIVER BC-1206

alternate numbers for what is the same tube from an engineering standpoint exist only to show operability under different conditions such as low plate voltages).

CHRS member John Wentzel (Aladdin Radio, San Francisco) did wartime service in the Army Air Corps maintaining these beacon transmitters. John's story fills out some detail about this system:

"In November, 1942 I enlisted in the Army Air Corps. With a previous knowledge of electronics, the Air Corps assigned me to the First Communication Squadron based at Muroc Bombing and Gunnery Range (now Edwards Air Force Base). Our job was to maintain the equipment used in the central tower, the point-to-point station and the Radio Range. The transmitter for the control tower operated on 210 kc, the Range transmitter on 350 kc. Point-to-point was a 10 channel Collins transmitter, in concrete radio shacks at the end of the runway. The tower used four Hammerlund Super Pro receivers with four more in the point-to-point station. All this ran 24 hours a day. Maintenance was mostly monthly tube testing and replacement. The Super Pros were very stable, once warmed up and set to frequency with a frequency meter (for example the BC-221).

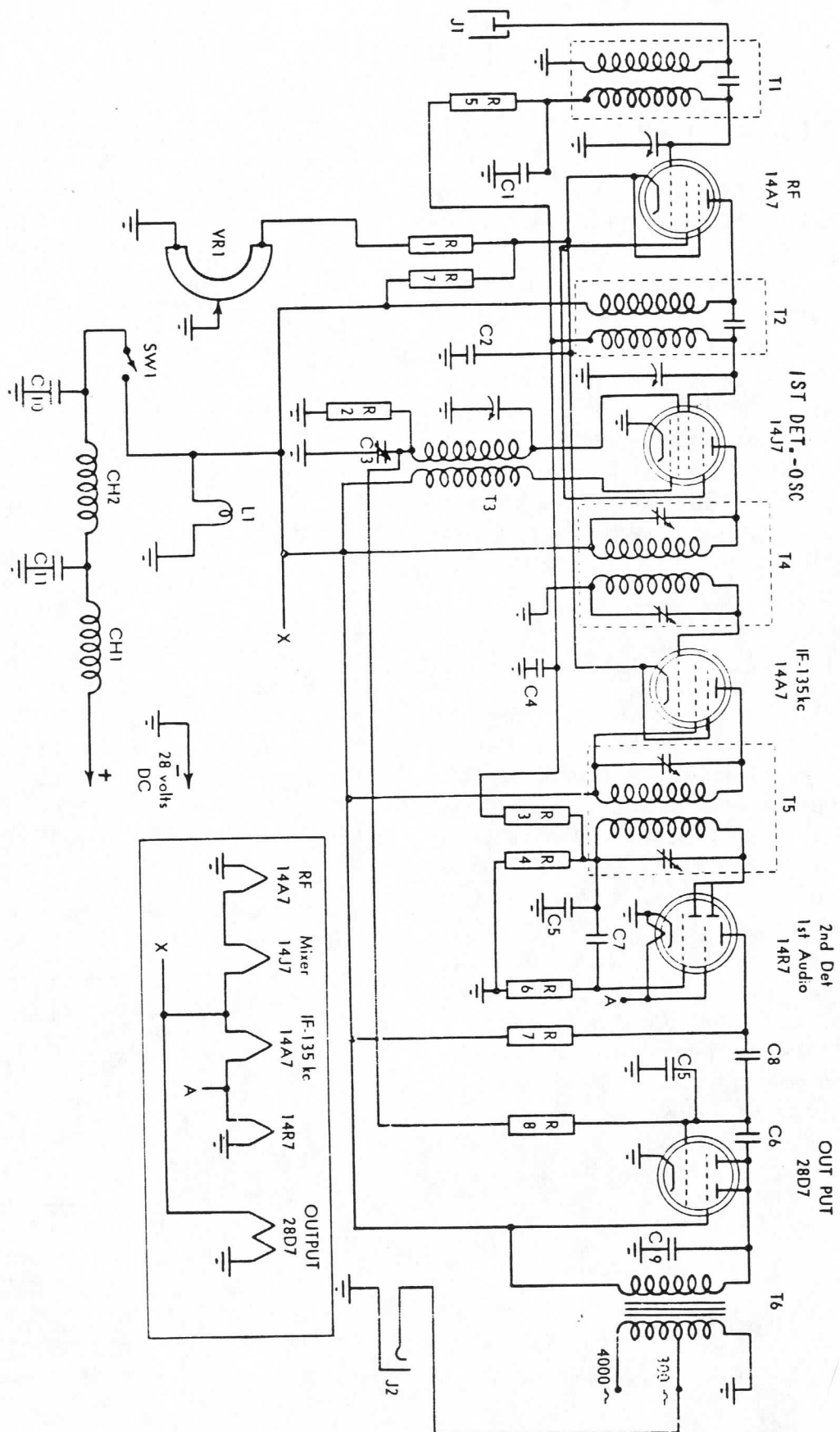
"Our Radio Range transmitter was made by Radio Receptor Company. The output was fed into two large loop antennae about 400 feet in diameter. An airplane coming in on the beam would hear a steady tone AM modulated about 600 cycles. If the pilot flew off to the left, the steady tone would become dit dah, if he flew right it would become dah dit. Every minute he would hear the station ID in code. When

the pilot passed over the transmitting loop antennae he would enter the 'cone of silence' and he would know he was about 2 miles from the end of the runway. VHF replacement for this long wave system started to appear in 1943, around 130 megacycles: no more lighting cigarettes off the low frequency antennae leads!

"After 1943 we became the Army Airways Communications System, AACS, and had detachments all over the world."

For surplus hounds with a hankering to power up a beast, this is a good candidate. All it takes is 28 volts, good tubes (available from Antique Electronic Supply in Arizona) and a loop antenna (or a long wire and a ground). There are still many single letter airport beacons in operation within the BC-1206's frequency range of 200kHz to 400 kHz, and until very recently still a few AM voice aviation weather announcements. Oakland Airport until recently broadcast on 362 kHz continuously. The aviation weather broadcasts can now be heard on HF on 8.828 MHz USB, and locally in the 110 to 140 MHz aircraft band, AM.

The BC-1206 radios can be found at swap meets for between \$5 and \$20. Accompanying this note is a schematic of the Setchel Carson version; if anyone wants the schematic of the rare Signal Corps version, or a copy of the manual, let me know. The tubes can be substituted with available types, according to Henry Engstrom: 14A7 = 14B7; 14J7 = 14S7 and 14R7 = 14E7; there is no substitution for the 28D7. All of these tubes are available from Fair Radio (419-227-6573).



SCHEMATIC DIAGRAM RADIO RECEIVER BC-1206

SURPLUS REDUX

Electric Radio is an outstanding monthly journal devoted in large part to military communications electronics (and communications receivers), with a ham orientation. They get them going again, and they tell you how. For those of us sharing these interests, this is the best regular publication. The Editor is Barry Wiseman and the address is Box 57, Hesperus, CO, 81326, Phone and FAX 303-247-4935. A sample issue is \$2, and subscriptions by First Class mail are \$30 and by 2d class mail, \$20. Check it out.

MILITARY SURPLUS RADIOS TODAY?

There are two good sources for current military surplus communications gear. Fair Radio Sales, (P.O. Box 1105, Lima, Ohio 45002, Ph:419-227-6573) is widely known, and it has been in business since the end of WWII. Fair Radio has everything still available; proprietor George Selati says ARC-5 gear is hot these days. Another source is Davilyn Corporation, which has recently sold the Collins R-390 and R-392, and some more recent gear. They can be reached at: 800-235-6222.

Copyright Bart Lee 1992 ##



WHY IS
THIS MAN
SMILING?

WANTED: Still looking for some WWII military radios, controls, power supplies, junction boxes, tuners, cables, plugs, racks, mounts, filters, dynamotors, etc. What do you have? Even incomplete items are useful. Also looking for mint Viking Ranger II and HRO-60. HENRY ENGSTROM, P.O. BOX 5846, SANTA ROSA, CA 95402 (707) 579-2070.

SAFETY FIRST: A Ground Fault Circuit Interrupter can keep you from being an AC-DC Ground, i.e. *DEAD*. Check it out. This one is typical, but they can be had at any hardware store for \$20. Eliminate all grounds from your work area and consider the old Navy trick: work with one hand, and keep the other in your pocket.



Portable Ground Fault Interrupter

This three-prong safety device allows ground fault protection nearly everywhere. Use 115 volt equipment, such as hedge clippers, electric grills, hair dryers, etc., without being injured if the equipment shorts out. Rugged rainproof construction includes test/reset buttons. Rated at 1800 watts. UL approved and meets OSHA requirements. Made in China.

1822T\$29.95

The Men who made Radio

BOOK REVIEW of

EMPIRE OF THE AIR

-- THE MEN WHO MADE RADIO

By Thomas S. W. Lewis

HarperCollins Books
ISBN 0-06-0018215-6

Reviewed by Bart Lee
Special to CHRS Journal
(Review Copyright Bart Lee, 1992)

Lee deForest, Edwin Howard Armstrong and David Sarnoff made radio what it was for its first 50 years, what it is today, and what it will become. Tom Lewis pulls together every thread to weave the fullest tapestry of early days of this art and industry. He spares none of the three any of their faults, while we and he marvel at RADIO, their accomplishment.

Our perspective is jaundiced by the technological miracle we live. We pick up a telephone to talk to anyone, anywhere in the world, and if its 3 AM we send them a FAX. We watch on live TV the history of the world unfold on CNN. The cable and the VCR provide rich choice to the most jaded tastes. All of this may well be just images cast on the wall of the cave, as Plato said, but we love it and we pay for it.

A hundred years ago, any of this wasn't even a gleam in the eye of

Heinrich Hertz, proving up Maxwell's equations with sparks and loops. Ninety years ago, Marconi could telegraph wirelessly, then transatlantically. Within the decade, Vladimir Poulsen first, then Fessenden, then deForest and others could send the voice (and music) of man through the ether. (Lewis oddly does not emphasize that it was deForest in 1908 who first conceived of radio broadcasting as we know it today, as he was the first to implement his conception, in New York, followed the next year by Doc Herrold in San Jose).

In another decade, the twenties, radio broadcasting changed the world forever. Radio (and then its idiot cousin, TV) made nations one nation, and the world one world, for better or worse. There have certainly been many messy details to work out, but radio and television have made us all into one network, rather than competing hierarchies of country, church and state.

Lee deForest invented in 1906 the triode vacuum tube that could amplify and oscillate (disguising his debt to Flemming's valve). DeForest's device, probably the most important single invention of the 20th century, made it all possible. Howard Armstrong, for thirty years and more, invented or developed the electronic circuits that put the vacuum tube to work, the regenerator and the superheterodyne, and frequency modulation. David Sarnoff guided the company that made these novelties into an industry: RCA.

Radio Corporation of America was a monopoly and a patent pool and

known as The Octopus. But it brought radio to the millions. Sarnoff thought up the "radio music box" for every home in 1916 and put it into the market after the First World War. The market could not get enough of them. Sarnoff then saw television coming and made it happen too, inaugurating regular broadcasting of the Farnsworth/Zworkin electronic system with the 1939 World's Fair. Sarnoff then foresaw all-electronic color television, and forced the FCC to reverse its approval of CBS's mechanical system. Sarnoff's was a hat-trick unequaled in American industry. Sarnoff did not invent but he made the inventions into products people would buy by the millions.

Tom Lewis tells this story with faithful attention to the truth. Lee deForest knew the research money and money for his fancy lifestyle was raised by charlatans from "suckers." Armstrong could not take the pressure of litigation and killed himself. Sarnoff destroyed the giant company he built, by putting an incompetent son at its helm. Yet these men discovered and created a new world, as surely as Columbus. DeForest said: "I discovered an Invisible Empire of the Air, intangible, yet solid as granite."

"The Radio," Lewis points out, with a quote from E.B. White, was for people of the 20s and 30s, "...a pervading and somewhat Godlike presence which has come into their lives." Americans in the depth of the depression "would sooner sell their refrigerators, bathtubs, telephones and beds to make rent payments than part with the box that connected them with the world." [page 231].

Another reviewer is right about this book: "The real story of the brilliant, difficult, driven men who developed radio -- and transformed American life -- is more compelling than any broadcast drama, and Tom Lewis tells it with a scholar's insight and a playwright's skill." (Geoffrey C. Ward, on the dustjacket). Lewis is perhaps too hard on Sarnoff, whose real sin was vanity, for few else had as much to be vain about. He is perhaps too kind to Armstrong, whose "inventions" more thorough research (*vide* OTB) will cast doubt upon: Armstrong perhaps developed the ideas of others for regeneration and the superhet. Armstrong did, nonetheless, promote the major technical advances of the art, especially FM, selflessly and at the ultimate cost to himself.

DeForest, too, deserves some debunking, if only because he paints such a rosy picture of himself in his autobiography. Still, Lewis finds him more of a fraud than deForest's intentions may warrant, and the debunking was anticipated by a 1942 magazine article. DeForest was, after all, acquitted of fraud charges, and when he put his little grid in Flemming's valve, man's technology took a quantum leap. These three driven designers of the modern world deserve Lewis' honesty, and his daunting scholarship, and his dramatic presentation. His errors are minor and technical. Lewis shows us how these men of radio deserve our admiration as well. This is as good a book as a radioman can read. ##

WLT

770 KILOCYCLES

1926

BOOK REVIEW of

WLT: A Radio Romance

By Garrison Keillor

Viking Penguin Books
ISBN 0-670-81857-7


Reviewed by Bart Lee
Special to CHRS Journal
(Review Copyright Bart Lee, 1992)

WLT is a very funny book. These stories are indeed a romance, stories of love and adventure when radio was new. The sidebar contains an excerpt reprinted on its dust jacket. From its inception in 1926 to the coming of television, 25 years, the fictional, mythical, near-mystical Radio Station WLT broadcast from the American bedrock of Minnesota to all of the mid-west, from early morning to late at night, 365 days a year.

This book chronicles the lives of the people who made the radio station, on-the-air and off-the-air, and sometimes when off-the-air got on-the-air. We who have lived in the mid-west will recognize much. We who know old radio will see and hear it all from the perspective of those in the studio, for 25 years. From the compulsive sex life of the owner to the prescriptions for right living of the young announcer (pretty good prescriptions, too), and with an occasional and hilarious scatological excursus, Keillor brings

these people to life. And just as a schematic diagram lays out the circuits of a radioset itself, these stories of their lives explain radio as it was made on a daily, weekly, yearly basis.

Garrison Keillor brought to National Public Radio his *Tales from Lake Wobegon*. He revived radio in the tradition of Jean Sheppard and the few other raconteurs who kept it alive after TV seized the eyes of America. He is an old radioman himself, in broadcasting since 1964. He writes here of what he knows; he knows whereof he speaks. It's real life, sometimes all-too-real-life, sad and tragic, wild and funny. Much of this material appeared first in the *New Yorker* as short stories; it comes together in the book near seamlessly. Sometimes I laughed so hard I cried, sometimes I had to laugh to keep from crying: an excellent book. ##

“h the days when radio was new, Wilmer. It was so beautiful. When Wingo Beals and the Shoe Shine Boys played 'Pat Him on the Popo' and the Norwegian Nightingale sang to his Tina and Leo told the one about the bed with a canopy. Back then, the WLT signal was received all the way to the Alleghenies and west to the Rockies. We amounted to something. Radio spanned the continent, and radios were built to pull in signals from far away. The Zenith had a tuning knob as big as a grapefruit. You'd spin that and bring in Nashville and Cincinnati and Detroit and Little Rock and Salt Lake City and Pittsburgh. These little dinky plastic pisspot radios you buy today won't get a signal from thirty miles away and why should they? The shows sound the same everywhere you go. The radio is filled with twenty-four hours of orange peels, cigarette butts, and coffee grounds, and it sells the beer, Wilmer, but gosh, what a comedown. All the shows are gone that let people sing on the radio who were *normal*. Those shows were chewed up and digested and shat out by big money, and now all you get is nasty songs by savage young capitalists. Radio used to be a dream and now it's a jukebox. It's as if planes stopped flying and sat on the runway showing travelogues. But of course if you climb on your high horse and talk about radio when it amounted to something, people mark you down as an old fart. So let's get out of here, Wilmer. Back to the barn. Radio is gone and it's time we went with it. All good things must come to an end, and here it is, the end.”

CRYSTAL CLEAR

BOOK REVIEW of

CRYSTAL CLEAR

VINTAGE AMERICAN CRYSTAL SETS...

By Maurice L. Sievers

Vestal Press

ISBN -0911572-86-4

Reviewed by Bart Lee
Special to CHRS Journal
(Review Copyright Bart Lee, 1992)

Standing on three legs, the Martian Big Four looks like nothing else in radio. This crystal set graces the cover of this fine book, the contents of which will tell you almost everything there is to know about crystal sets, crystal detectors and crystals. The photography does justice to the subjects. The author supplements the photos with reams of reference data on these sets. If you can't find it here, I don't know where to tell you to go.

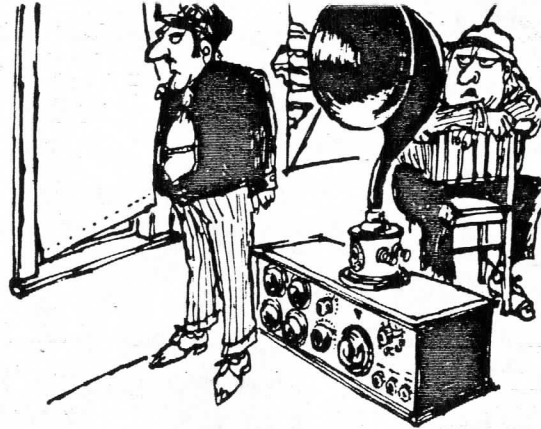
The crystal detector and the triode were patented in 1906 and 1907 respectively. It was, however, the crystal detector (galena or silicon or carborundum) that first stimulated the development of radio. With a crystal detector, a radioman could *hear* signals, and the human ear is a sensitive and discriminating instrument. The earlier Marconi and Branley coherers sent detected pulses to pen registers or other paper devices. They were neither sensitive or discriminating. The Marconi magnetic detector was insensitive. With a crystal detector and a telephone receiver, however, a trained ear could pick a spark signal's

tone out of the noise, and the ear could tell, say, a 240 cycle rotary gap from a 60 cycle straight gap. In the days when QRM first polluted the already noisy ether, the crystal detector first permitted the ear to filter the desired signal from the hash and noise.

With the advent of the broadcasting of music and voices in the early twenties, the crystal set brought radio to America, before the vacuum tube came into its own, as oscillator and amplifier. Vacuum tubes, however, cost big money, and all too soon after 1929, few people had any money at all.

The crystal set, however, never needed tubes. It was easy to manufacture and easy to make at home. In the twenties it was many families' first radio and many boys' first project. It was simplicity itself. In the thirties, crystal sets were the cheapest sets available.

Crystal sets did require earphones, and America wanted loudspeakers (or "loudtalkers" as they were first called). Loudspeakers needed tubes to drive them. The crystal set nonetheless survived into the 50s as a boy's first radio. The crystal detector sufficed for any nearby radio station. It also was sufficiently sensitive for DX, the distant stations by the reception of which young men measured their budding technological prowess. Radio became the force it was in American culture as America first listened to crystal sets. Mr. Sievers' book brings this hardware to the fore, in a very nice, and thorough, presentation. We owe him a vote of thanks for writing the book he was always looking for. ##



"What if we never do hear from the museum—
who's gonna fence this piece of junk?"

MARTIAN BIG FOUR ->

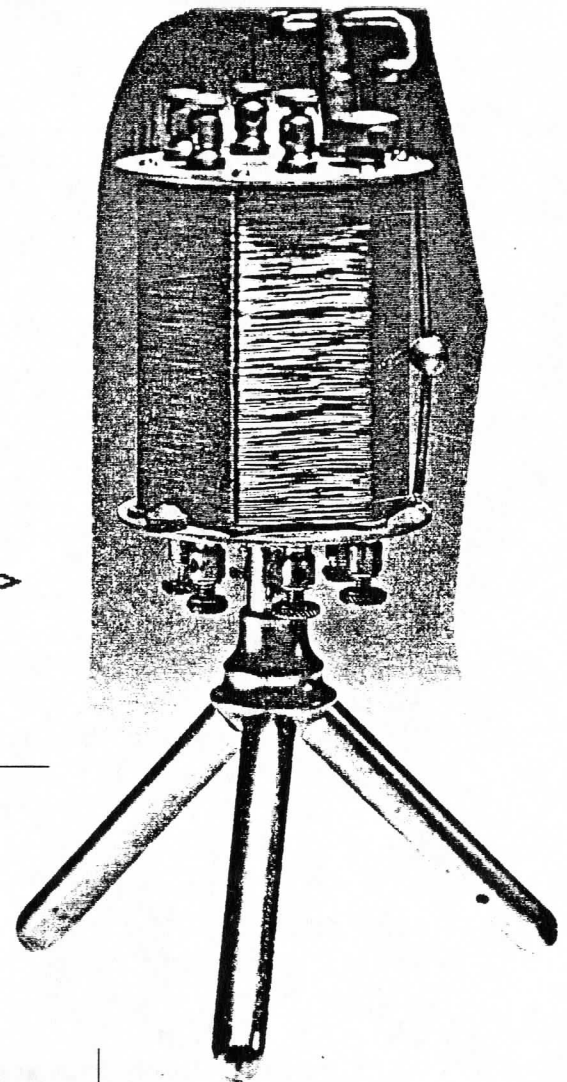
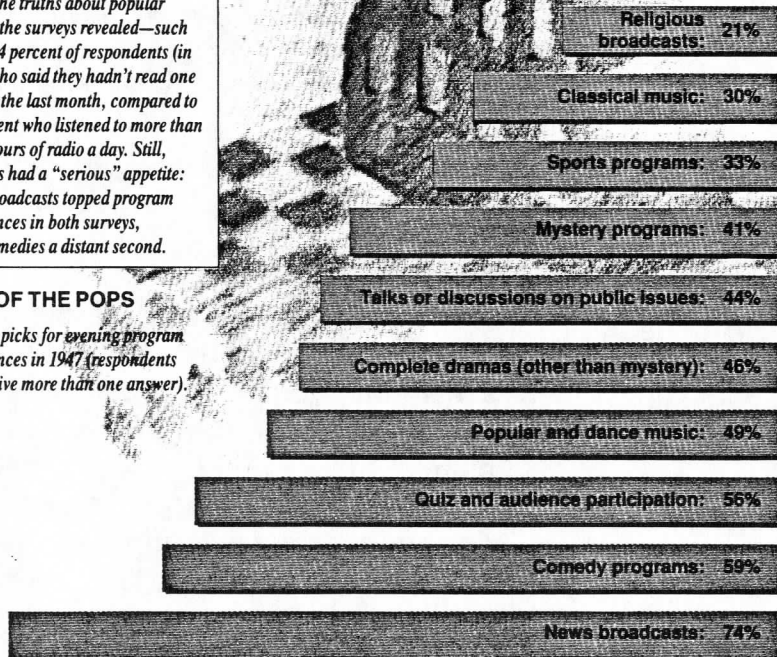
A Night at the Wireless

In 1945, when NORC undertook the first nationwide survey of public attitudes towards commercial radio, critics charged that the survey, sponsored by the National Association of Broadcasters, was biased. Two years later, NORC did a follow-up survey, taking pains to involve those earlier critics in the questionnaire's planning.

Perhaps the critics simply could not accept the truths about popular culture the surveys revealed—such as the 74 percent of respondents (in 1947) who said they hadn't read one book in the last month, compared to 59 percent who listened to more than three hours of radio a day. Still, listeners had a "serious" appetite: news broadcasts topped program preferences in both surveys, with comedies a distant second.

TOP OF THE POPS

Top ten picks for evening program preferences in 1947 (respondents could give more than one answer).



"I'd like to contact the late Atwater Kent about a power-supply circuit."

1947 RADIO LISTENER PREFERENCES: National Opinion Research Center at the University of Chicago, illustration by Allen Carol (University of Chicago Magazine, April, 1992, p. 16): Then, as now, people listened to radio primarily for news, then entertainment.

rodriguez

CARTOONS COURTESY
ELECTRONICS ILLUSTRATED
MARCH 1969

W6AM The Old Man

BOOK REVIEW of

DON WALLACE: W6AM

AMATEUR RADIO'S PIONEER

By Jan D. Perkins

Vestal Press

ISBN -0-911572-99-6

Reviewed by Bart Lee
Special to CHRS Journal
(Review Copyright Bart Lee, 1992)

California's W6AM is the legend of Amateur Radio. Don C. Wallace was its legendary operator. He worked every country in every mode on all bands.* He bought the Palos Verdes Peninsula antenna farm of Press Wireless, and put its rhombics to work on the ham bands. He even put a kilowatt transmitter in his car. He was, as Jan Perkins aptly characterizes him: "the Consummate Radio Man."

This is a really good book, well researched, well written and well documented with photographs and more. It presents Don Wallace's early days as well as his later fame. Wallace was a Navy Radioman in San Francisco in the First World War. He became President Wilson's radio operator on the voyage to Versailles. He won Herbert Hoover's Silver Cup for his amateur radio station in the early twenties. He personally selected the wavelengths for what we now know as the AM broadcast band, and he was himself a pioneer broadcaster. In those days he also worked other broadcast stations with his ham rig, always high powered.

Wallace was always a beacon to newcomers; he became the grandest of the grand old men. Amateur operations and operators have for 90 years now paralleled, and often anticipated, the development of the radio art, and allied technical specialties (radio astronomy for one, computer networks for another). It is the story of such men as Don Wallace, so ably told by Perkins, that tells the story of amateur radio. Look not to the dusty bound volumes of QST for the life of ham radio -- look to men like Wallace, in the 1930s "the California Kilowatt."

Jan Perkin's book has been a labor of love. He had access to all of the Wallace materials and archives. There is not likely to be another such radio biography, with an author so well matched to subject, and with such a depth of resources to call upon. In the history of radio, the hams have had as much to say as anyone, (and perhaps everyone). Don Wallace and his W6AM (x9ZT) were the paradigm of amateur radio operation. There can be no understanding of the development of the radio art without an appreciation of the hams, and Wallace was a ham's ham.

Wallace also wrote prolifically in the thirties, and original copies of his collection of his technical pieces can still be obtained from Jan Perkins. It is quite a nice period piece, and the circuits are tempting: one's hand reaches for the soldering iron. Wallace had a long and fruitful life, an almost magical life. Perkins does him justice.

##

* (except maybe Kuwait on single sideband).

WANT ADS

FOR SALE: MAJESTIC MODEL 93 CONSOLE. FULLY RESTORED
\$495.00

PHILCO CONSOLE, 1937 MODEL 37-116 THE TOP OF THE LINE SET
RESTORED, BEAUTIFUL, FANTASTIC TONE, EARLY HI-FI MODEL
\$325.00

1940 CROSLEY MODEL 629-M RESTORED MINT CONDITION. SMALL
CONSOLE WITH ART DECO STYLING
\$285.00 CALL JOHN WENTZEL AT (415-731-1920)

FOR SALE: PANASONIC B&W PORTABLE TV, MODEL TR 900 A/C OR
BATT WITH BATTERY PACK AND CHARGER (TBP165A) \$35.00 PLUS
SHIPPING

WANTED! METER FOR A HICKOK 539B TUBE TESTER
KENNITH MILLER 10027 CALVIN ST. PITTSBURG PA. (412-242-4701)

WANTED! 40/20 METER COIL SETS OR WINDING DATA FOR PRE WAR
MEISSNER SIGNAL SHIFTER HENRY MEYER W6TDP
30 TOBIN CLARK DRIVE HILLSBOROUGH CA. 94010 (415-349-2071)

WANTED! A HORIZONTAL WIDTH COIL, LISTED AS T-4, 490-OMH FOR
A WESTINGHOUSE 1942-44 B/W TV MODEL # H223 PART NO. V-6500-1
5000 OHM COIL CALL SANDRA AT (510-891-2370) BEFORE 1:30
PM OR ANYTIME ON WEEKENDS

MOTOROLA 7 INCH BLACK AND WHITE TV FOR SALE: CONTACT MRS
R.A. HOLMES, 36 KEY COURT, OAKLAND CA. 94605

WANTED! PLASTIC CABINET FOR A TELE-TONE MODEL 230

FOR SALE ATWATER KENT MODEL 145 IN WORKING CONDITION
\$250.00 CABINET NEEDS TOUCH UP, ORIGINAL FINISH FAIR

ZENITH BLACK DIAL CONSOLE 6A05 SHORT-WAVE, AM, SMALL CONSOLE
\$250.00 PLAYS CALL JIM (510 676 2605)



CHRS 1992 CALENDAR

JANUARY	FEBRUARY	MARCH	APRIL
SATURDAY 18th Swap Meet: Benicia Home Video Service	SATURDAY 29th Swap Meet: AMPEX CORP. in Redwood City. 8:30 AM. (No earlier-- Gates Are Locked!!!)	SATURDAY, 28th SWAPMEET: OAKLAND at MIKE QUINS' SURPLUS 727 Langley, just off of Doolittle Dr. near Oakland Airport. Begins no earlier than 9:30am	SATURDAY 4th Swap Meet: Petaluma Location to be announced.
MAY	JUNE	JULY	AUGUST
SATURDAY 2nd Swap Meet: AMPEX CORP. in Redwood City, 8:30 AM SUNDAY 10th Annual Picnic: at Tilden Park in Berkeley Hills. Bring battery sets; any era and Your Family!!!	SATURDAY 13th Regional Swap Meet: San Luis Obispo Location T. B. A. Info.: Dan Steele (805) 544-2904	SATURDAY 11th Swap Meet: San Francisco at St. Anne of the Sunset Church. Funston @ Irving St. 8:00 AM Setup. Info: John Wentzel (415) 731-1920	SATURDAY 1st Swap Meet: AMPEX CORP. in Redwood City. 8:30 AM (No earlier-- Gates Are Locked!!!)
SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
SATURDAY 26th Meet/Picnic: Fairfield @ Electricity Museum. Directions T.B.A. BBQ Cooking Facilities, Train Museum Tours BRING THE FAMILY!!!	SATURDAY 10th Regional Swap Meet: in Redding. Location T. B. A. Info: Norm Braithwaite (916) 246-4209 SATURDAY 24th Swap Meet: Benicia at Home Video Service	SATURDAY 7th Swap Meet: AMPEX CORP. in Redwood City. 8:30 AM (No earlier-- Gates Are Locked!!!)	HAPPY HOLIDAYS!

Directions to AMPEX CORP.

Hwy. 101 to WOODSIDE ROAD in Redwood City
 Go West on Woodside Road.
 Pass two stop lites (Veterans, Broadway)
 At next street, TURN LEFT (South) on BAY ROAD.
 LEFT at the THIRD STOP SIGN
 into PARKING LOT "C"

FOR CHRS INFORMATION CALL: Jim McDowell (510) 676-2605

SCARS SWAP MEET DATES:

February 15th: Torrance
 May 16th: Torrance
 August 15th: Torrance
 November 21st: Norwalk
 Info: Bob Baumbach
 (818) 845-7807