

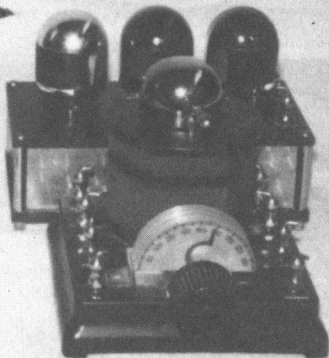
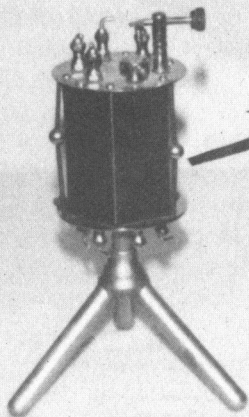
The Colorado Radio Collectors Antique Radio Club

# FLASH!

Dedicated to the Preservation and Documentation of  
Wireless, Radio, Television and Associated Equipment

Volume 9 January ☺ February 1998 Issue 1

Greetings, and  
Happy New Year to all  
you Earth people!



## *In This Issue...*

- ♦ Martian Radios ♦ Dealing with AGC Problems ♦ Powering Up Old Radios ♦
- ♦ The CRC 1998 Roster ♦ A Replica "90" Project ♦

## ABOUT THE COVER

They're heeere! Yes, thanks to Wayne Gilbert, we were warned *just* in time to thwart the invasion by none other than the Martian - well, radio that is. Quick, turn to page 7 and get the low down on just how close to the edge we came.

By the way, have you notice the new style formatting of the Flash!? Good? Bad? How about letting the Flash! publisher know what you think?

## The Coloradio Collectors Antique Radio Club

**Meetings:** Unless otherwise noted in this journal, regular meetings are held on the second Sunday of every other month starting in January (except: 3rd Sunday of May) at 1:00PM at the VectraBank Building, Community Room, 1380 S. Federal Bl. The meeting normally includes business items, discussions, "show and tell", a raffle and a swapmeet.

**Membership:** All dues are \$12.00 annually. Joining dues are prorated to June 1st. Contact club for foreign rates. Send dues and membership inquiries to the CRC Treasurer, Dick Hagrman, 3429 W. Berry Pl, Littleton CO 80123 (303)794-6674 - rhagrman@aol.com.

**Article Contributions:** Submission of articles are always appreciated. This would include historical and technical items as well as stories about individual collections. Articles may be written or e-mailed, and need not be in final form. Submissions and requests for information should be directed to the CRC "Flash!" Publisher, Larry Weide, 5270 E. Nassau Cir., Englewood CO 80110 (303)758-8382 - lweide@ibm.net.

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**Want Ads:** Submission of Sell/Want ads are always free to CRC members. Non-members may advertise in the Flash! for \$0.20 a word. Display advertising is available by contacting the CRC publisher, Larry Weide, for info and rates.

**Publishing Deadlines:** All submissions must be submitted by the 1st of Feb, Apr, Aug, Oct and Dec. for publishing in the following month(s).

**Thanks** to the **Pressworks** for printing the Flash! - (303) 934-8600

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**Upcoming 1998 CRC Events:** January 11th, Regular Meeting - March 8th, Regular Meeting • Watch for the annual April Show and Sale announcement •



# *Colorado Radio Collectors Antique Radio Club*

Founded October 1988

**Dedicated to the Preservation and Education of  
Wireless, Radio, Television and Associated Equipment.**

Volume 9, Issue 1

January/February 1998

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# **A CHAT WITH THE PRESIDENT**

## **Happy New Year 1998!**

by Neil Gallensky, CRC President

I hope each of you experienced a wonderful holiday season and that all of your wishes for the New Year come true. As the New Year begins, I would like to reflect for a few moments on our success as an organization during 1997.

Our club continues to be strong and vital. Under the skilled leadership of David Boyle, our outgoing president (outgoing in more ways than one!), we enjoyed several excellent club-sponsored events, including the Spring Show, Summer Picnic, and Auction. These events would not have been successful without many dedicated volunteers, and all of your efforts are much appreciated. I would like to thank each and every one of you who have dedicated your personal time and creativity to planning and supporting our club sponsored activities.

Additionally, I would like to extend my special thanks to Larry Weide for his tireless efforts in producing this wonderful club newsletter. Larry, your passion for excellence clearly shows, and without your dedication, we would not have the Flash. Please take the opportunity to express your personal appreciation to Larry next time you see him.

As I begin my term as CRC President, several thoughts come to mind. First, I feel sincerely that it is a privilege to be a member of the CRC, and I take the responsibility of leading the organization very seriously. For our club to succeed, we must find ways to engage and involve the membership - that's all of YOU - in activities which will be fun and rewarding. The new year brings many challenges, which I would like to summarize in the few simple requests which follow.



**1. Please find a way to participate in club activities. Your officers can't and shouldn't shoulder the burden alone! Write an article for the Flash. Bring a display to the Show and some radios to the Auction. Donate some items to the club for our monthly raffle. Make a presentation at a club meeting. Offer to lead or support a team which owns one of our regular or special club events. Two specific examples of roles which need to be filled ASAP: we need a Chairperson for the Spring 1998 CRC Radio Show, and we need a CRC liaison to the Wings Over the Rockies Air and Space Museum (to plan and support a club-sponsored display). If you can't find an existing activity which excites you, make an offer to sponsor a new activity!**

**2. Communicate with each other and your officers. If something is going well, positive feedback is always appreciated. Similarly, if something is bugging you, think about what it would take for you to feel better about things, and provide constructive feedback. I'm always happy to discuss questions or issues with club members; keep in mind that if you have a great idea, I may ask you to help in rolling out the idea to the club and possibly turning the idea into action!**

**3. Network with each other! There is absolutely an incredible wealth of knowledge and experience among our members. Don't be afraid to ask questions; there really is no such thing as a "dumb question" when it comes to radio restoration, technology, or history. And the opportunity for creating lasting and rewarding friendships among club members is a treasure which should not be underestimated.**

**In closing, I would like to offer the following thought. Colorado Radio Collectors is really not an "organization". It is a collection of incredible individuals, dedicated to a shared mission (the collecting and preservation of old radios and their history) and to a common avocation (the love of old radios). YOU are the key to the CRC's success. Let's build on our past success and work actively together to make 1998 the best year ever for the CRC!**

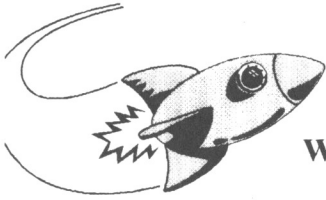
# THE COLORADO RADIO COLLECTORS ANTIQUÉ RADIO CLUB 1998 MEMBERSHIP ROSTER

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# Martian Radio Discovered in Denver!



by

Wayne Gilbert, CRC Member

There may or may not be life on the planet Mars, but there can be no doubt whatever that there are Martian radios on planet Earth, and there is considerable evidence that they have been here since 1923. It also seems abundantly clear that it may not be a coincidence that the lunar lander has a remarkable resemblance to the one of the earlier Martian radios.

Although there has been no acknowledged government investigation as to how these radios came to be on this planet, reliable sources have led this investigator to believe there may have been insider involvement. Although some models of these radios bear very earth-like names like "Big 4," "Special," and "Little Gem," there were radios blatantly sold with the brand name "Martian Radio" conspicuously affixed to them. This seeming total lack of concern for secrecy by the producers of these radios has led some to speculate that they may

have been manufactured right here on this planet, by humans!

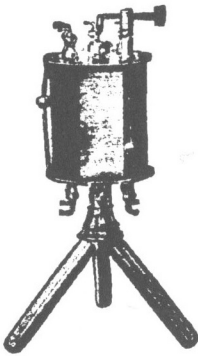
All of the Martian radios discovered and identified, to date, are rather small in size, which is perhaps the first tangible clue as to the size of the Martian race. These radios display a level of technology that would lead this investigator to believe that their designers, while not having a threateningly advanced society, were indeed familiar with the use of primitive transistor technology. Ingeniously, some even may say cleverly, nearly all of these radios were marketed as what earthlings would call "crystal radio" sets. And, as another possible Martian attempt at subterfuge, all of these radios were sold in the early to mid 1920s, when earth-built crystal sets were exceedingly popular and utilized the same technology.

Cleverly, the price of these radios was kept "down to earth," with both the Blair Company and the Martian Manufacturing

Company's "Martian Big 4" sets selling at a low, low price of 7.50 earth dollars. The price of the other Martian licensed radios was correspondingly low.

However, it was not the price of these radios or even the audacity of the radios' manufacturers that led

shape and is very esthetically proportioned. The Martian "Special" is the more modest of the models with its coil mounted in the middle of a base, surrounded on three sides with the crystal cup and lever connecting posts for earphones, antenna and ground.



9 Inches High  
Beautifully Nickel  
Plated

## MARTIAN BIG FOUR

The Wonderful High Grade Crystal Radio Receiving Set

SIMPLICITY                      EFFICIENCY                      QUALITY

The Martian Sliders (2) for sharp tuning produce clearness and volume

One, two, three or four headsets can be used. One to eight persons can "listen in" at one time.

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Anyone Can Install and Operate the Big Four

Guaranteed to receive concerts from all broadcasting stations within a radius of 30 miles.

If your dealer cannot supply you, we will send you a Martian Big Four set prepaid anywhere in the United States upon the receipt of Price, \$7.50

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this investigator to question their origins; rather it was the radios' unearthly esthetic design. All of these radios are very attractively designed crystal or one tube radio, whose style radically departed from the standard box shape of the other radios then on the market which, perhaps unwittingly, set these radios apart from their competitors.

The design of all these radios is dominated by the coil, which has an unusual hexagon or octagon

The Martian "Beauty" model radio is also mounted on a base but has a tuning capacitor instead of the crystal cup and cat whisker. The truly unique feature of this radio is that its one tube is mounted inside the coil with only the tube's dome-like top exposed. This gave the set a very definite "flying saucer" appearance, which is the first indication of the possible true origins of the radios' designers. An additional amplifier unit, with three tubes, could be

attached to the set, making it the most powerful of the Martian radios.

It is the Martian "Big Four" model (and its production twin, the United Company's "Little Gem") that truly reveals the suspected identity of these radios' designers. These radios have the coil mounted on a tripod with three legs, in a design that closely resembles a modern lunar lander. It seems unlikely, to this investigator, that anyone could look at one of these radios and not suspect that C. L. Marti, the owner of the Martian Manufacturing Company, may have inadvertently disclosed the origins of his radios' design with this set.

In an attempt to calm any irrational fears that may have been generated by the disclosures of this investigation, it should be pointed out that these radios were only guaranteed to receive broadcasts from stations up to 30 miles away and have been subsequently removed from the market. Few of these radios can be found in use today, and even a survey of the known radio collectors in Colorado has uncovered only a very few of these radios remaining, even as collector's items.

Although it is unlikely that Denver will ever again face the threat of a Martian radio invasion, all readers are reminded to use the utmost caution when approaching the seller of one of these radios, and everyone is urged to immediately notify this investigator prior to spending any of their earth dollars to purchase one of these sets.

**Sources:**

Brooks, L. Personal interviews. March-April 1997.

Radio News. December 1923. p 835

Sievers, Maurice. Crystal Clear. The Vestal Press, Ltd.

# Collector Books for Sale

CRC Members get specially reduced prices on popular collector books. ONLY non-Front Range by mail.

**\*\* This listing has been updated. Please discard previous Flash listings \*\***

	Retail	Club
ANTIQUE RADIOS, COLLECTOR'S GUIDE - 4th EDITION Bunis, 1997 values, revised & updated, new photos, 248 pgs	\$18.95	\$14.00
GUIDE TO OLD RADIOS, POINTERS... - 2rd EDITION Johnson, 277 pages, 1995-96 prices	\$19.95	\$14.00
ANTIQUE RADIO RESTORATION GUIDE - 2rd EDITION Johnson, 144 pages, repairing, refinishing, cleaning	\$14.95	\$11.00
RADIO & TELEVISION PRICE GUIDE - 2nd EDITION Harry Poster, 1994 values, 195 pages, Years 1920 - 1990	\$17.95	\$13.00
RADIO, EVOLUTION OF THE - VOLUME ONE 227 pages, 118 in color, More than 800 radios pictured and priced for 1992, picture from the collections of CRC members Jim Berg and Johnny Johnson	\$22.95	\$16.00
RADIO, EVOLUTION OF THE - VOLUME TWO All different from Volume One, 226 pages, Color, Radios of the 1920s - 1960s, with 93-94 values, pix from CRC member Jim Berg	\$24.95	\$17.00
TRANSISTOR RADIOS, COLLECTOR'S GUIDE VOL II Bunis, 1996 prices, Full Color	\$16.95	\$12.00
TRANSISTOR RADIOS, COLLECTOR'S ENCYCLOPEDIA Lane & Lane, 1994-95 prices, 168 pages, Photos, 2200 listings	\$19.95	\$14.00
ZENITH TRANS-OCEANIC, ROYALTY OF RADIOS Bryant, 1995 Price Guide, 160 pages, History/Restoration, 100 Photos	\$24.95	\$17.00
RADIOS BY HALLICRAFTERS Dachis, 1996 values, 220 pages, 1000+ pics, id's, history	\$29.95	\$20.00
CLASSIC TV'S, PRE-WAR THRU 1950'S 86 pages, color & b/w pics, descriptions, etc.	\$18.95	\$14.00
Machine Age to Jet Age, Radiomania's Table Radio Guide I, '33-'59 Stein, 255 pages, 100's photos	\$24.95	\$17.00
Machine Age to Jet Age, Radiomania's Table Radio Guide 'II, 30-'59 Stein, 358 pages, 100's photos	\$28.95	\$20.00



# Recognizing and Dealing with AGC Problems

by

**Al Klase, Guest Author - address to AWA**

[This month we are pleased and privileged to have Al Klase as our guest author. His article is being reprinted from the November/97 Delaware Valley Historic Radio Club's journal, the OSCILLATOR, with the kind permission from the DVHRC editorial staff. - Ed.]

Do you reach for the RF gain control when you tune in your local AM broadcast station? One of the most commonly heard complaints from owners of "boatanchor" communications receivers and other vintage high-performance radios is: "The audio is distorted on strong signals." While audio distortion may be the result of an inoperative or poorly tuned stage or stages in the receiver, once the first-order bugs are exorcised and full sensitivity is realized, this distortion is almost always an AGC problem.

## **THE NEED FOR GAIN CONTROL**

The overall combined maximum voltage gain through the RF and IF stages of common receivers is on the order of a million. For AM and SSB reception, all of these amplifiers must

operate in a linear mode, i. e. they must not saturate or clip, if the signal's modulation envelope is to be reproduced accurately. Obviously, the full gain of the receiver is needed only for the weakest signals.

In tube-type receivers the RF and IF gain control is almost universally accomplished through the magic of the remote-cutoff pentode. The gain of amplifier stages using these "variable mu" tubes, such as the 6K7, 6SK7 and 6BA6, can be varied electrically by changing the bias on the signal grids. Because the gain of a single stage cannot be reduced to zero, gain-control signals are generally applied to all the RF and IF amplifier stages and sometimes to the mixer(s).

## **AUTOMATIC GAIN CONTROL**

In almost all receivers since the early 1930s, especially for AM reception, the RF and IF gain is controlled automatically. This not only accommodates fading, but avoids "blasting" on strong signals or missing weak signals altogether when tuning across the band. Throughout the 1930s and early '40s this function was referred to as automatic volume control (AVC). In the WW II era, with

the introduction of systems, such as N and radar, where the parameter being controlled is not audio volume, the term automatic gain control (AGC) began to creep in. For our purposes, it means the same thing.

In broadcast receivers, the AGC function is universally present, but is generally hidden from the user. The "volume" control knob affects only the gain of the audio amplifier. Communication receivers usually have both automatic and manual RF gain controls. The manual control is intended for use in situations, such as CW reception, where the AGC circuit may not function properly. Any quality communication receiver, in proper operating condition, will receive all but the most grotesquely strong AM signals with minimal distortion in the AGC mode with the manual gain control wide open.

## IMPLEMENTATION

AGC is accomplished by recovering a DC signal from the detector stage that is proportional to the signal strength and applying it to the gain-controlled stages in such a way as to reduce the gain as signal strength increases. In tube-type receivers, the AGC voltage will always become more negative with increasing signal strength. The AGC signal must be low-pass filtered to remove the audio component of the signal, lest the AGC system suppress the modulation of the incoming signal.

In most common applications, the AGC signal is picked off from the junction of the last IF transformer secondary and the detector-diode load

resistor (which may be masquerading as the audio gain control potentiometer). The AGC signal will pass through a series of high-value resistors on its way to the control-grid return connections of each of the gain-controlled stages. This AGC "bus" will also have a number of capacitors from the various resistor junctions to ground. The larger caps, at the detector end of the bus, establish the basic AGC time constant, while the others further filter the AGC signal and bypass stray RF signals to ground.

## THE PROBLEM

The receiver is in ostensibly good operating condition: All stages have known good tubes with the appropriate voltages on their elements. The set is aligned properly and all the adjustments can be peaked. And, you can hear weak signals at least down to about 10 microvolts. When tuned to a distant AM station the audio sounds good. When tuned to a local, distortion is obvious, and goes away when you switch to AGC and reduce the gain. The condition can also be obscured by connecting a modulated signal generator to the antenna terminal. You should be able to bring the signal level up to the better part of a volt before serious distortion can be heard or the audio output "folds back" to a lower level.

The AGC bus is generally a very high impedance circuit so as not to load the detector circuit unduly. Furthermore, because the gain of the controlled stages increases EXPONENTIALLY with a decrease

in AGC voltage, even small amounts of leakage will cause the AGC system to malfunction. The source of this leakage is almost always the capacitors on the AGC bus. How much leakage is acceptable? Al's Law: 10 megs is a significant problem, 1 meg is a disaster.

## THE FIX

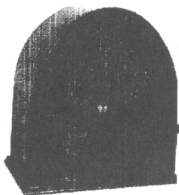
In receivers with paper caps, especially the dreaded "Micamolds", or anything coated with wax, **REPLACE ALL THE PAPER CAPS.** In fact, do this before you even turn the set on and save yourself a lot of trouble. A quality vintage receiver can often be brought back to life and play quite nicely by just shotgunning the caps and making no adjustments at all. Then a "light" alignment puts it in primo condition. I keep coming back to an observation I heard from an old-time race-car mechanic: "Don't even try to tune junk,"

So you do the above, and things get better, but there's still a problem with strong signals. What now? Make a Xerox copy of your schematic, and highlight the AGC bus. Disconnect the bus from the diode-load resistor and measure the resistance from the bus to ground. It should be essentially infinite. This will enable you to find any caps you missed (or decided to ignore like those inside IF cans), other leaky components (I'm starting to find leaky postage-stamp mica caps) or physical shorts. Most digital meters measure to 20 megs and are usually adequate. The Hewlett-Packard HP 410 series of meters will read

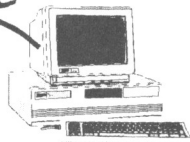
hundreds of megs and are recommended for the truly paranoid.

Some receivers, the R390 family in particular, have a high-value resistor to ground at the far end of the AGC bus. You need to disconnect it to perform the above test.

When you look at a schematic, the AGC circuit is all but invisible. So it's not surprising that it's often overlooked as a source of trouble. Hopefully, this article will help get the old sets playing properly again.



# Heard on the Net



Hi fellow collectors!

This month I'd like to call your attention to museums that focus on antique radio and associated equipment and, of course, have web sites for you to browse. Some of these are "virtual" museum, but many have actual geographical locations that you can visit if you're in the their neighborhoods. You can find these and **much more** by doing a search on no more than "radio museum". Of course by using this search string you'll also get stuff like "Connie's **Museum of Radioactive Reptiles**" and other sites you're probably not interested in.

**[www.antique-radio.org](http://www.antique-radio.org)**

**The Bellingham Radio Museum**

History, Pictures, Audio clips, and free tours of museum location

**[home1.swipnet.se/~w-12206/radio](http://home1.swipnet.se/~w-12206/radio)**

**German radios by brand and model**

Pictures, vast link list to other museums and collections

**[www.cyberventure.com/neutraliti](http://www.cyberventure.com/neutraliti)**

**Heathkit Museum**

Pictures and specs. of most equipment, links to tech info and associated sites

**[www.kwarc.on.ca/hammond/](http://www.kwarc.on.ca/hammond/)**

**The Hammond Museum**

Pictures and historical data of and about Marconie and his equipment, links to many other sites, museum location tour information

**[www.wa3key.com/collins.html](http://www.wa3key.com/collins.html)**

**Virtual Collins Museum**

Pictures of all models, stories, references/links to tech and other info, links to other Collins sites

**[www.chss.montclair.edu/~pererat/telegraph.html](http://www.chss.montclair.edu/~pererat/telegraph.html)**

**Telegraph Museum**

Large collection of references to telegraphy, wireless & scientific sites, foreign references

Enjoy!



# Powering-Up Old Radios

by Dave Gonshor, CRC Member

[Particularly for those who haven't had a lot of experience in this area, pay heed to a very experienced collector who's learned the hard way. Follow Dave's advice and you can't go wrong. - Ed]

The cardinal rule is: **DON'T** just plug it in and see if it works. While the chances are pretty good that you won't damage it, the consequences of plugging in a radio with a short are severe: you may destroy the power transformer by overloading the B+ due to shorted filter capacitors or other faults. Replacement power transformers are hard to find, especially those with 2.5 volt-AC filament windings, and they are expensive. Here are some suggested steps to follow before powering-up any old un-restored AC radio.

**Replace the power cord if needed.** Old cloth covered power cords many times have dangerous breaks in the wire insulation. Old rubber cords can also be bad. Use

newly manufactured cloth cord if desired to preserve originality.

**Re-Cap the power supply filters.** No matter what, recap the main smoothing filters in the power supply. Modern electrolytic capacitors are relatively cheap and are far better than anything used as original equipment or as replacement capacitors from that repair job in the 1940's. The old caps may appear to be OK, but don't trust them. Even a small amount of leakage can generate heat that causes the old capacitor to quickly go bad. If the old filters are top side on the chassis, you can leave them there and hide the new filters under the chassis. Or, the old filters can be rebuilt with modern capacitors inside to retain that original look. Do not simply parallel new filters with the old ones. The old filters can still short or provide a leakage path if left in the circuit. If necessary, install a terminal strip to create a mounting place for the new filters.

**Check out the power transformer** (if the set has one). Remove the rectifier tube. Plug the set into a variac. If you don't have a variac, then skip this step, but don't run a power transformer unloaded because the high voltage winding will have on the order of 1000 volts on it and may break down. Remember, that transformer may be sixty plus years old! Use the variac to slowly bring the voltage up to 50 volts ac or so. Measure the filament voltages on the tubes remembering that the line voltage to the set is lower than normal. Measure the high voltage winding at the rectifier tube socket and look for signs of shorting. It should read well over a hundred volts AC in the unloaded condition (no rectifier tube installed).

**Some Safety Cautions.** If the radio doesn't have a power transformer (AC-DC set), the chassis may be "hot" depending on which way the power plug is inserted in the receptacle. Either use an isolation transformer, or if you don't have one, measure the AC voltage from the chassis to earth (water pipe or receptacle ground). If the chassis is "hot", reverse the plug and repeat the check. It's a good idea to install a polarized power plug to ensure the chassis is always at ground potential. On any set, even those

with a power transformer, look for bad AC capacitors connected from input power to chassis. A shorted capacitor here can connect 117VAC to chassis (hot chassis) and be very dangerous.

**Test the tubes.** The vast majority of tubes found in old sets will work just fine. Nonetheless, this step will find the rare shorted or open filament tubes. This is especially important for the rectifier tube because a bad rectifier tube may be a sign that the B+ is (or was) shorted.

**Install a fuse.** This step is optional, but a good idea. An in-line fuse holder can be hidden under the chassis. Place the fuse between the input power and the on/off switch. Usually a two amp slow blow fuse is adequate (around two hundred watts load protection).

**Power up the set with a variac.** Now you're ready to power up the set. Don't forget to plug in the speaker because the field coil of the speaker is often used as a smoothing choke in the power supply. Place a DC voltmeter on the main B+ and bring the input power up slowly with a variac. The rectifier tube should begin to work with an input voltage of around 50-70 volts AC. You should see B+ start to rise as the

rectifier starts working. Be ready to shut the set down if B+ doesn't come up, is erratic, or you hear or see sparking or other evidence of shorting. If you're reading a good steady B+, you can advance the input voltage to full AC (usually around 117 VAC). If the fuse blows, check again for shorts. If you're lucky, the radio will play, or at least you'll hear something coming out of the speaker.

**If you don't have a variac, make a test jig with a lamp bulb.**

Wire a lamp socket in series with the input power. Use a hundred watt bulb. When you power the set up, the lamp should glow dimly. If it glows at or near full brightness, you have a short and should shut power off immediately. The bulb will protect the power transformer to some extent by limiting the current into the radio.

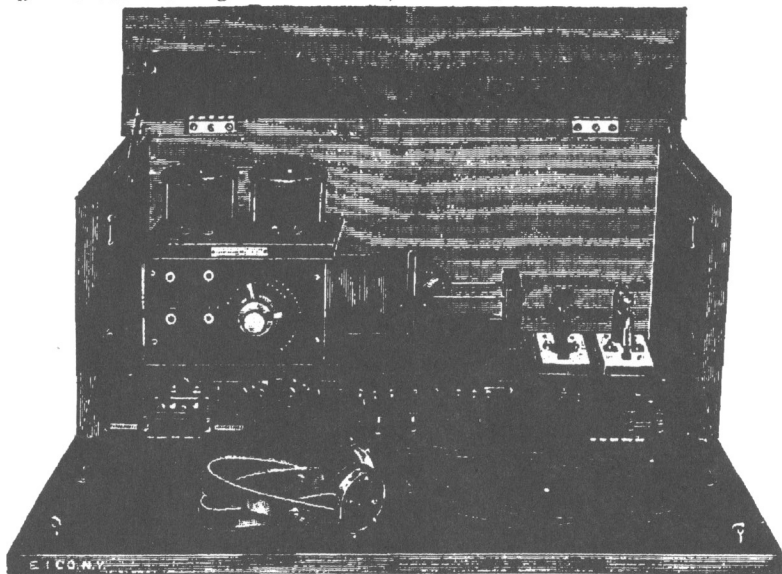
Once you have good B+ you can start trouble shooting other parts of the radio circuits if needed. As always, be careful around B+ or input power!

(Many thanks to Bill Grimm for his critique and suggestions on this article).



## The "Electro" Commercial Wireless Receiving Outfit

Our long experience in quantity manufacture has enabled us to design a standard commercial receiving outfit which, for price, finish, durability, flexibility, tuning qualities and long range, is absolutely unsurpassed. It will tune to any wave length from 200 meters to 10,000 meters and the selectivity is so perfect that interference is absolutely impossible. Guaranteed under normal conditions and when used with an aerial 150 feet long and 100 feet high to receive 2,000 miles.



No. GEX1387

Case is of solid mahogany hand rubbed and finished throughout and closing entirely to make it dust proof. Convenient handles also make it portable. Coupler is of navy type of mahogany with switches on the primary, one of which controls the winding in groups of ten turns and the other in individual turns. The secondary has a switch of odd but efficient design. There is a 43 plate rotary condenser across the primary which can be disconnected at will by a switch. There is also a 43 plate rotary variable condenser across the secondary. For extra long wave lengths a loading coil with 7 points is provided. Two detectors, one a crystal type and the other the celebrated Radioson, ensure always one detector in good order. For the most perfect results with both detectors a rotary potentiometer and proper switches are provided as is a suitable blocking condenser. Needless to say all wiring is concealed and all switches are mounted on hard rubber and wherever possible of the rotary type. The binding posts are large, and well finished and all marked by nickel name plates. All metal is nickel plated and polished. One pair of 4,000 ohm "Government" receivers are furnished and of them nothing more need be said. Altogether it forms an outfit designed for commercial work, especially on ships. The outfit is absolutely guaranteed in every respect and of all those supplied by us not a single owner has made one complaint.

Cabinet size is 48x16x20 but the size can be slightly altered to suit special needs. Net weight is 50 lbs.

No. GEX1387 "Electro" Commercial Receiving Outfit as described **\$75.00**  
Shipping weight 80 lbs.

The Electro Importing Co's Wireless & Electrical Cyclopedia Catalog - 1918



# A Philco 90 Replica Project

(Bringing new life to an old radio)



*It's Alive!*

by

Dave Boyle, CRC Member

It all started when I saw this rusty and battered Philco 90 chassis at the club swap meet several years ago. I'm a "would be" Philco collector, so this would be an opportunity to buy some spare parts for \$10.

Once on my shop workbench a careful examination indicated that all the under chassis components were intact. However, the top side was covered in several layers of dirt, crud and rust (fig. 2). This poor physical condition even extended to a large dent on the side of the chassis. As I started the chassis disassembly I made a decision to attempt a restoration - a daunting challenge and my favorite kind of radio work.

I went ahead and took off as much of the above chassis hardware as possible, even drilling out retaining rivets as required. The power transformer was left intact since removal can create more harm than good. A one half normal AC power check indicated all outputs to be OK.

After the dirt, grime and rust removal, I masked off the entire chassis, straightened out the dent in the side frame and continued to prepare for chassis painting. The paint color closest to matching the original plating is called "Steel Wheels" spray paint, available from Checker Auto Parts. Figure 3 show the chassis prepared for painting. At this point I was ready to

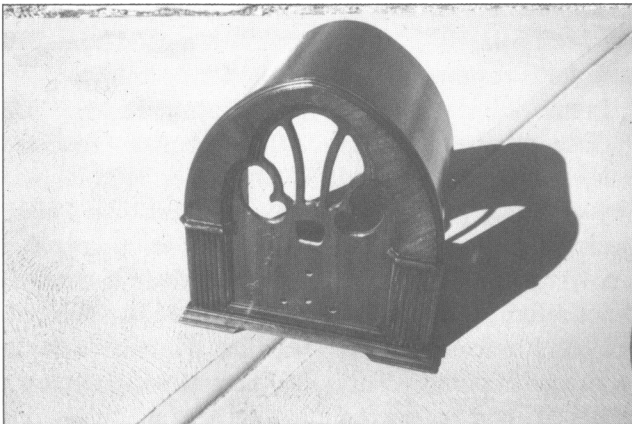


Fig. 1

begin the actual parts refurbishment and restoration.

Figure 4 shows the disassembly and restoration of the tuning condenser, and gives an idea of the extent us radio restorers go through in the pursuit of a quality project. The restored tuning condenser is shown ready for installation back onto the chassis, shown in figure 5.

It is now time to turn the chassis over and electrically repair and restore the "inner workings". The first step was to use electronic circuit cleaner in a spray can, along with a stiff brush, to clean up sixty years of tar, leaking capacitors and mouse droppings. **Always perform the solvent cleaning process outside for proper ventilation.**

I do not subscribe to the school of total re-capping. My experience with Philco sets of this vintage tells me to only replace the filter caps and those exposed to B+ voltages. Obviously, 'caps showing signs of leakage, overheating and damage should be replaced. On this set I ended up replacing approximately twenty assorted 'caps and resistors.

Continuing with the restoration and repair activity, I removed several coils in order to replace all the grid cap wires. While doing this I refurbished the windings by cleaning, performing a resistance check and then coating the windings with polystyrene "Q" dope.

Since I did not refurbish the power transformer I injected silicone sealant into the lead wire egress points. This provides mechanical and dielectric strength for those old insulated wires.

Other restoration activities included some new wiring, grouping and cabling some long lead wires and generally "beautifying" under-chassis parts.

At this point I would direct your attention to Dave Gonshor's article, on page 15 of this issue, concerning powering up an old radio, as an example of procedures that I was careful to follow.

With the radio now working, I directed my final restoration efforts to painting the transformer and applying "fake nickel" spray paint to the tube shields (as close to the original as I care to come - \$\$). Figures 6 and 7 show the underside and topside of the restored Philco 90 chassis . As they say, "You've come a long way baby!"

With an extensive restoration project such as this one, tuning of the IF and RF frequency adjustment trimmers will be a necessity, and was accomplished after several hours of aging and test.

This restoration work was accomplished over the winter months of 1993 - 1994. I now had a chassis in search of a good home.

In 1996, following up on an ARC ad, I contacted a Mr. Dick Oliver (now a CRC member - see our want-ads this month). For \$175 he built me a brand new replicate of a Philco 90 cabinet, as shown in figure 8. When the cabinet arrived I compared it to my own Philco 90. the only difference was that didn't have the usual signs of 60 years of wear and tear (patina). The cabinet was an outstanding example of true craftsmanship.

Next, I went in search of an in-line tube shield, you know, the one that was always thrown out by the previous repairman or owner. Again, an ARC ad lead me to M. B. Gaskins in Kentucky at (502)465-3755. For \$36 he sent me a good duplicate fabricated from galvanized sheet steel. I used a color copier to reproduce the Philco tube location label and the ID label. Both labels look pretty good.

CRC member Dick Hagrman supplied me with a Philco 6" speaker which was then re-coned at National Speaker here in Denver. I painted the speaker frame with a brown paint similar to the original speaker color. This speaker came from a Philco 50 series radio. Fortunately I had an exact part number Philco audio output transformer to go with this speaker. I used new cloth covered wires that were similar in color to the original for the speaker/field coil attachment wires.

I had to fabricate the speaker grill cloth support from cardboard, using my original Philco 90 support as a pattern. The grill cloth is the original style obtained from John Okolowicz (215)542-1597 - also available from AES. Reproduction knobs and the dial face escutcheon were generously given to me by Larry Bordonaro, owner of "Old Time Replications" (818)786-2500. These molded parts appear to be exact duplicates.

Figure 9 shows the entire cast of characters, except the cabinet, required to manufacture a Philco 90 replicate. Kind'a like a Heathkit, so to speak. Not shown are four latex rubber washers and the chassis to cabinet

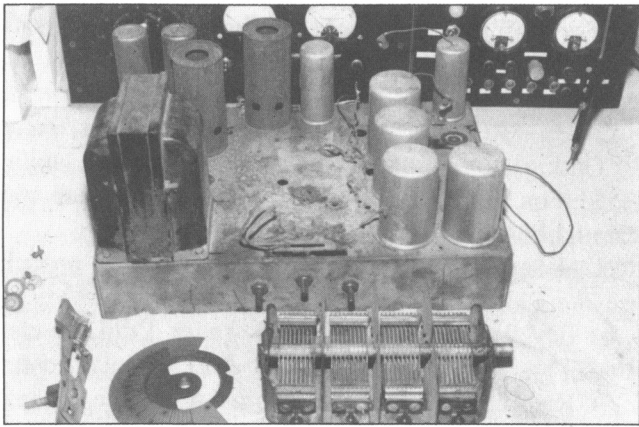
attachment screws. The latex washers were purchased from AES.

Cabinet finishing was fairly straight forward. All the molding pieces required toning with a dark aniline dye. I used a Minwax Jacobean stain on all surfaces of the cabinet.

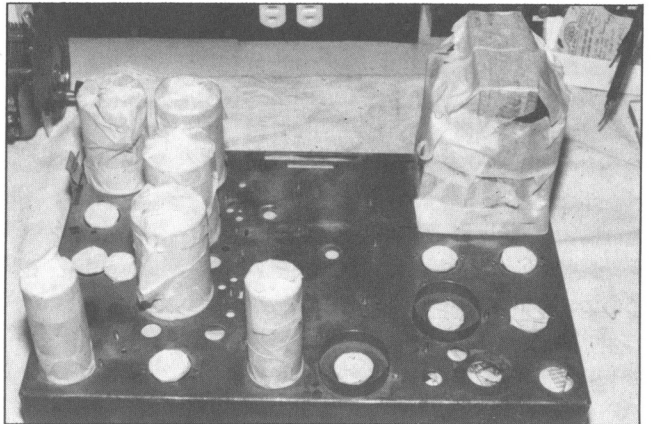
I'm not attempting to describe finishing operations in this already too long article. However, I did use clear lacquer filler and final coating finishes. Rubbing was done between coats using 0000 steel wool and #400 wet/dry sandpaper. Johnson's Floor Wax was the final coat. Please see figure 10 for a visual presentation of all the supplies that went into the finishing operation.

Figure 1 is the completed cabinet. **Remember, spraying of lacquers must be done outside or with adequate ventilation.**

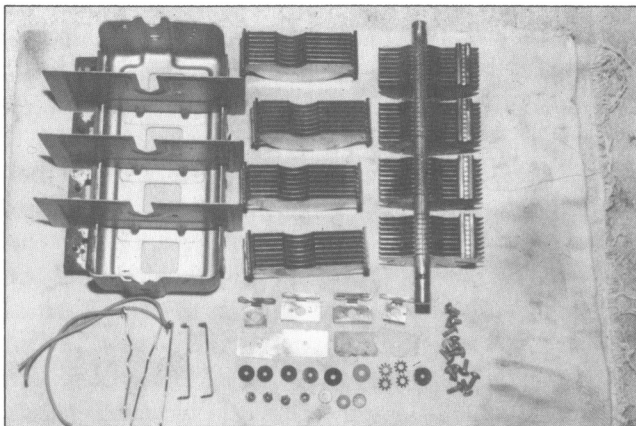
Unfortunately, I don't have a picture of the completed project. However, I'm bringing the radio to the January CRC meeting - most of you will see for yourselves a "genuine" Philco 90 replica.



**Fig. 2**

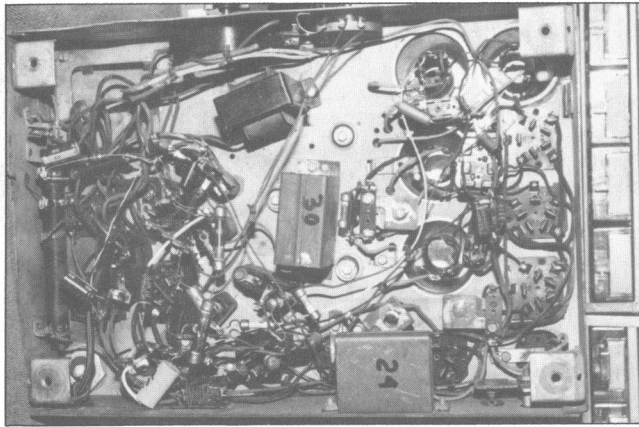
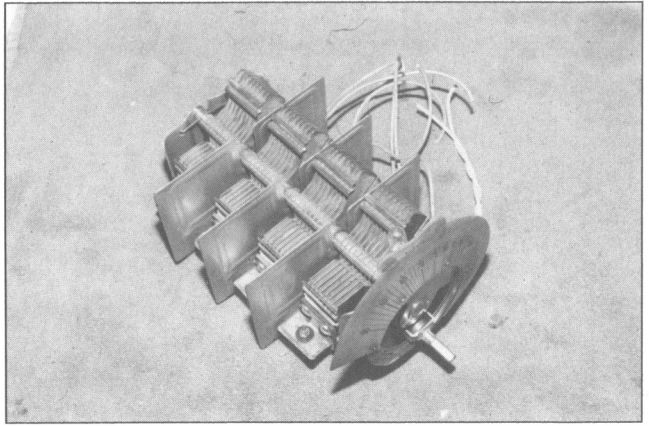


**Fig. 3**



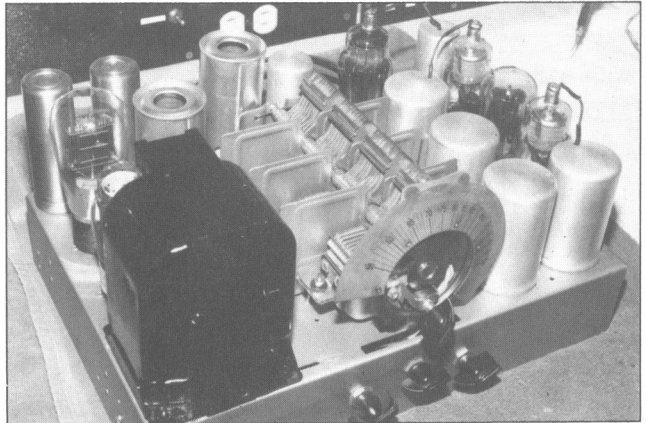
**Fig. 4**

**Fig. 5**



**Fig. 6**

**Fig. 7**





**Fig. 8**



**Fig. 9**

Photograph not Available. - Ed.

**Fig. 10**

# " The Open Trunk "

## Classified Advertisements

Classified ads are free to members. Call, see, mail or e-mail your ad to Larry Weide, CRC publisher (see IFC).

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WANTED: Zenith T/O, Model 7G605, "bomber" or "sailboat". I will pay top dollar. **John Miner**, (303)831-5252 - daytime

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WANTED: Cabinet for an Atwater Kent Model 36. **Doug McDowell**, (303)794-9047  
dmedmail@concentric.net

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FOR SALE: Reproduction Philco Cathedral cabinet parts. Front panels, rear arches, bottom mouldings. Grandfather clock finials, colonial clock top trim and finials. Reproduction 90 cabinets. Other needs such as other style mouldings from you sample. Inquire. **Dick Oliver**, Antique Radio Svc., 28604 Schalm Dr., Elkhart IN 46517. (219)522-4516

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FOR SALE: Reproduction lid tags with warranty card for the Crosley 51, 51P, 51E and 51SD... \$4.00 each. When requesting one, please send the serial number of the set.

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FOR SALE: Copper Rod, save \$\$\$\$\$\$, several diameters available to make your own soldering iron tips (or I can for you).

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FIRST CLASS



**Mark your calendars!**

**The CRC January meeting is on Sunday, the 11th at  
1:00pm**