Colorado Radio Collectors Antique Radio Club

The FLASH!

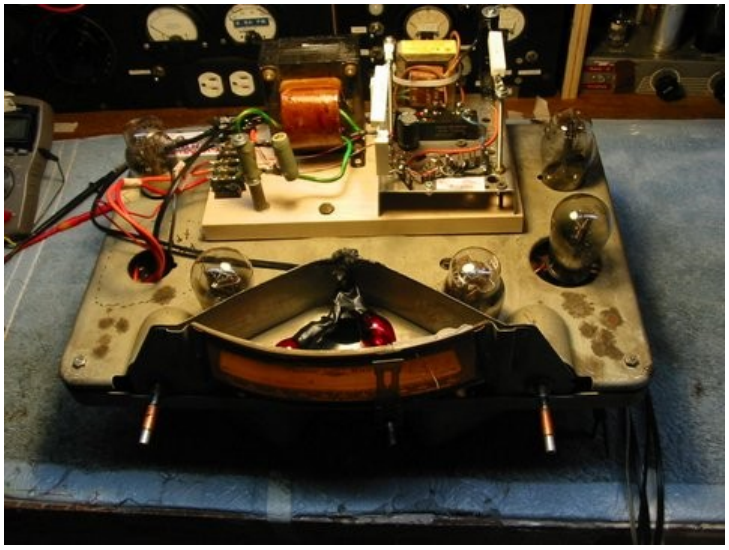
Dedicated to the Preservation and Education of Wireless, Radio, Television and Associated Equipment

Volume 24, Issue 4 | The July 14th meeting is at the Miller Library in Castle Rock | July/August 2013

"Hybridization" Of A Victor RE-57 Console R/P

By David Boyle

Have you ever started a radio repair project…and wished you hadn't? A frequent customer of mine brought me this large…and quite heavy, maybe about 140 pounds, console to repair. The Victor RE-57 is one of several models in 1930-1931 that featured an RCA dual chassis radio/amplifier and electric phonograph. One could even record 78 rpm records from the radio program then playing. The cosmetic condition was quite shabby and the chassis was in even worst condition. Anyway, I accepted the challenge with some caveats. Several years ago I spent a month of Sundays on another similar RCA RE-35 radio/phono. console for another customer. This time I was wiser… I would repair each major component, get paid, then move on to the next component. I wanted the customer to participate in this high risk involved project.



This article is primarily a "photo-journalistic-documentary" of this extensive project. My intention in writing this is, perhaps to, motivate some readers to persevere, think beyond their skill level and use some "out-of-the-box approaches" in solving an ever emerging series of repair issues.

Some Background

By the late 1920's RCA had successfully developed a TRF design concomitant with improved manufacturing techniques. Their TRF radios were quite competitive with RCA's own superheterodyne design and, evidently, also had cost and reliability advantages. These several short lived model series utilized a unique horizontal lever tuning system. This lever was connected to a 5 inch diameter rotating "turntable" which in turn moved 5 similar connecting linkages to each of 5 tuning condensers. This mechanical arrangement allowed for each TRF amplifier stage to be separated sufficiently and well shielded from surrounding TRF stages. This configuration would minimize adverse interstage coupling. The mechanical tuning arrangement afforded precise synchronization of same resonant frequency of each RF stage. This increased selectivity beyond previous designs. Each RF stage was also designed to be self neutralized, no adjustments provided as in earlier models. WOW…what a mouthful!

Amplifier and Power Supply Chassis

Starting first with the power supply and amp. chassis **(Photos 1 & 2)**. The required repairs were as expected…these generation chassis seem to have at least 1or 2 transformers that have failed, I was not disappointed! Repairs were basically filter caps, new push-pull driver transformer, several power resistors and some wiring changes (we will get into this later-on). The chassis provides all required voltages for itself and the radio chassis. An 8 wire cable connects both chassis. The chassis has a mounted 10 inch electro-dynamic speaker, P-P #45 triodes for audio, and # 80 rectifier.

TRF Radio Chassis with First Audio Stage

Refer to **Photo 3 and 4**

These pictures show the top and underneath of the chassis. Of note: the unique tuning system. The manual tuning lever coming in from the front of the radio is attached to the rotary "turntable". Horizontal movement of the lever is translated into a back-and-forth circular motion. The four prominent coils (as shown in **Photo 3**) for each TRF stage are located adjacent to their respective amplifier tube socket.. The underside photo clearly shows the bottom of the tuning "turntable" attached to linkages that reach out to each stage tuning condenser. All tuning condensers are normally enclosed inside an aluminum can shield, now removed for repair purposes.

Preliminary circuit tests indicated that most circuit components were ok. After powering up and further stage-by-stage testing it was discovered that two small RF coils, each located inside and at the bottom of two of the main RF coils were open. This was an elusive issue because these little coils are not on the schematic! One of these coils is shown in **Photo 5.** The photo shows my feeble attempt at a replacement/repair. Not knowing coil electrical parameters won out…no luck!

I was able to actually get the radio and amplifier system to work but with two missing stages …totally inadequate performance. These two non-reparable stages rendered this radio chassis as *junk.*

<u>Now the challenge behind this saga begins…….</u>

COLORADO RADIO COLLECTORS ANTIQUE RADIO CLUB
Founded October 1988

Message from the President

This is turning out to a typical summer... "much-to-do-about-everything." But not too busy to reflect back on the 25 years or so since some of us charter members started the Colorado Radio Collectors club in the basement of past member Ron Smith's home in Littleton. These reminisces lead me to say that these years of club activity and events have immeasurably enhanced my life.

I got interested in "electricity" as an outgrowth from my hobby in chemistry when I endeavored to make a wet cell battery to operate a small light bulb. The rest was a gradual evolving entanglement in electronics. I still have my Link brand soldering gun given to me by my encouraging parents on my 13th birthday. I would bet that many of you started an early interest in radio and electronics as I. Working in my college sponsored Radio and TV Repair Shop was additional valuable experience for this present hobby.

Now that I may be considered one of the *senior members* of our club I would say, unequivocally, that I still look forward to many more years of enjoyment and satisfaction that I receive in return as an actively engaged and participating member. **Thank you all for keeping this club a neat place for me to play out my this part of my life!**

At the May meeting we discussed a few new topics. Marty Phillips and a fellow club member are checking out the possibility of our CRC club purchasing the late Charles Brett's remaining stock of old radio and related subject books. This would allow the continuation of book sales to club members at remarkably low prices.

Jim McCutcheon and Steve Touzalin are evaluating the costs associated with switching our FLASH to another company that would print it in **color.** We looked at some sample copies...they were quite enticing! More on these subjects at our July meeting.

Coming up: September annual auction and BBQ...and in November at our Castle Rock library meeting we will all "get-stuffed" on a club provided pizza luncheon. Be sure to attend...get you dues partly back!!

The **special topic** at our upcoming July meeting will be clock radios...or radios with clocks!

David Boyle

CRC CONTACTS

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Webmaster **Website**	**Bill Grimm** **www.radioace.com**

NOTE: at = @ in email addresses

Upcoming Events

9-29 CRC Auction

Meeting Locations
(Unless noted otherwise)

Littleton	**Castle Rock**
January	March
May	July
September	November

CRC MEETINGS

Meetings are held on the 2nd Sunday of every other month starting in January (except May is 3rd Sunday) at 1:00 pm. The meetings consist of business, "show & tell", raffles, auctions, swap meets, technical discussions and other subjects of interest

CRC MEMBERSHIP

Annual membership in the CRC runs from July to June. Dues entitle members to attend meetings, "The Flash!" our newsletter, discount book prices, participation in our spring show and Fall auction. Current annual dues are $20. New memberships will be prorated to the following June.

(Continued from page 1)

The customer and I spent two weeks searching the internet for a replacement chassis. He finally found a "junker" radio chassis out of Florida for $10.00. It was from an earlier RCA model RE-45 that uses the same type of tuning mechanism and has somewhat similar chassis configuration. **Table 1** tabulates some significant differences and variations in design of the replacement RE-45 chassis.

RE-45 Radio
Characteristic Differences
Chassis width: about the same
Chassis height: higher by about 1 inch
Control location: wider by 2&1/2 inches lower by 2 inches
Wood escutcheon: protrudes from front over 1 more inch, different radius
TRF tube: type 26 triode, 1.5 v. filament. RE-57 uses type 24 screen grid, 2.5 v. fil.
TRF circuit of RE-45: antenna amp. stage, 3 RF stages, tuned
TRF circuit of RE-57: 4 stages RF amp., & detector stage.
The RE-45 chassis does not have a first audio (driver) stage.
The RE-57 radio chassis has a first audio stage

Table 1

When the RE-45 chassis arrived the first order-of-business was to determine the feasibility of its fit into the console. **Table 1** indicates the dimensional and chassis front panel major differences. That could be remedied with some extensive wood working… after the electronic differences were solved. As with the now junked RE-57 radio chassis, a thorough checkout was performed before adding all tubes and powering up by connecting to bench power supplies, antenna, and earphones. Of course, it did not work. Trouble shooting led to a non-functioning 1st. stage antenna amplifier circuit…incidentally I never did get this stage working properly so I wired around it. Still had 4 stages of TRF amplification, more that sufficient amplification for today's AM broadcast power levels.

Next step was to design and build a power supply for this radio. The electrical power requirements were quite different than the, now repaired, amplifier/power supply (A/PS) could provide. During the radio chassis final repair and adjustment process it appeared that the optimum B+ voltage for radio performance was only 80 to 85 volts. The filament requirements of the four- # 26 tubes was 1.5 volts ac. The # 27 detector tube requires 2.5 volts ac which was ultimately provided from the A/PS chassis. I built this little power supply on a piece of 1X6 wood using available parts. I "designed-in" ample component margin to ensure relative cool operation and long life. The B+ output is regulated at 82 volts @ 20 ma. and the filament voltage is 1.5 ac @ 4.2 amp. This "sub-chassis" is shown in **Photo 6** during a fit-check to the top plate of the radio chassis where it will be eventually mounted.

The following photographs and accompanying text tells the rest of the story. That, of which, was required to get these disparate components: radio, A/PS chassis, and phonograph to play satisfactorily together.
Then the console cabinet would need modifications so that the radio would nicely fit and operate well inside it.
All that, not unexpectedly, turned into quite a chore!

Photo 7: "Bread-boarding" the new power supply to the RE-45 radio. Rewiring modifications to the volume control. This was required due to the inoperative antenna amplifier stage that required shunting around. Other minor circuit repairs were completed and then adjustment of all the neutralizing condensers in each RF stage unique to the Re-45 completed the radio chassis for now.

Photo 8: Console woodworking mods. underway. Shown is the radio dial escutcheon after a severe 3/8 inch milling of the backside to reduce the amount of protrusion of the face.

Photo 9. First of zillions of radio-to-console fit checks. Each one resulting in gradual console wood working efforts. Height, face opening, and control hole location changes had to be made.

Photo 10. The entire system of components is now prototyped on my busy work bench and consists of 5 separate units:

1) RE-45 radio.

2) Power supply for the radio.

3) RE-57 amplifier/power supply with attached 10 inch speaker. What this picture also shows in the fore ground above the soldering iron is a small self contained solid state** phono. preamplifier with a separate phono. volume control laying on top of it. **Hence, the word "hybrid" in this article's title.

4) Preamplifier…**Table 1** Indicates that the RE-45 radio chassis did not have the 1st. audio amplifier required by the magnetic pickup in the phonograph. The difficulty is two-fold: proper load impedance to the pickup and in turn matching the new preamplifier impedance to the main audio amplifier interstage driver transformer. The impedance matching for the pickup took place in the selection of the phonograph mounted volume control ohmic value. The impedance matching between the solid state preamplifier to the audio output circuit was by previous mentioned modifications to the radio's volume control on that chassis. After the proper impedance matching of the phono pre-amp the next important consideration was where to inject this signal into the amplifier. Provisions must be made to then switch amplifier inputs between the radio and the phonograph. That was achieved by rewiring the original radio/phono switch which is located on the front of the radio chassis. Shielded wire was used for inter connecting all audio circuits.

5) Phonograph…This was originally provided with a complex rotary selector switch to afford either playing a record, recording a record from the radio, or just playing the radio. The wiring also included an impedance matching transformer for the magnetic pickup. All of this was removed and the phono was completely rewired to include the new volume control. **Photo 11** shows the underside of the phono. deck. Note the volume control barely visible upper right. Also added a grounding wire to all motor parts to preclude possibility of ac hum in the pickup signal. The plug-in pickup head was rebuilt by Vintage Phono Service in Johnsbury, VT. After completely cleaning the crud and old lubri-

(Continued on page 4)

(Continued from page 3)
cants off the motor and mechanism it was then thoroughly lubricated. The phonograph platter was then given a speed test utilizing a strobe and synchronizing disc…all was fine.

Photo 12 shows the completed, highly modified RE-45 radio. Note the new dial lamps, they are two old red Christmas tree lamps wired in series to obtain just the right amount of luminance behind the dial. You can also see the two control extensions required to fit through the cabinet.

Photo 13 "Roughing-in" woodworking modifications including new control shaft holes through the pressed wood decorative molding. They had to be ground out by a die grinder after they started to fall apart using a drill bit.

One cannot help noticing the crappy finish on the console front. It looks like it was varnished with a toothbrush. The owner says that he doesn't mind the cosmetics…just wants good performance……."…well, I'm working on that" was my reply, "…please send another progress payment!…"

Photos 14 and 15 Rear and front views of the almost completed "Hybrid" RE-57. Cabling up of the interconnecting wires and owner refinishing of the lighter color radio escutcheon are the only items to complete this project.

Summation

Would I take on a project like this again? Probably, for that is what I do!

Time span of start to finish was about three months, labor hours somewhere between 60-70 hours, and brain food for an 'ol man… Priceless!

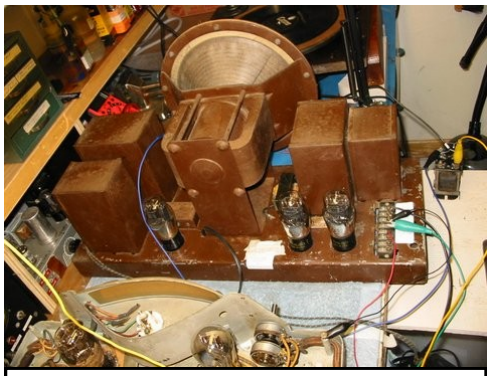


Photo #1
Amp., Power supply & Speaker

Photo #2
Underside A/PS Chassis

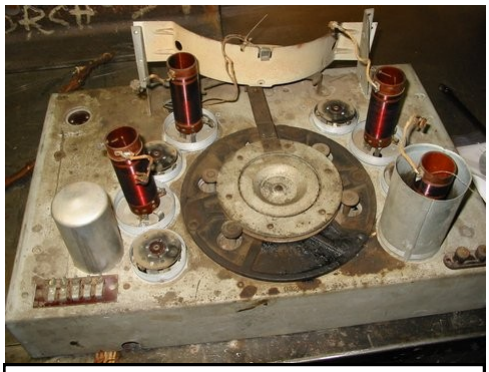


Photo #3
Original RE-57 Radio Chassis

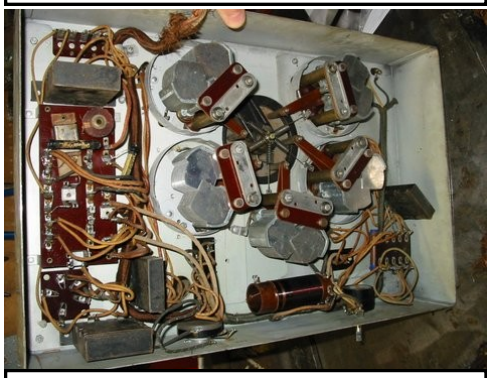


Photo #4
Underside of RE-57 Radio

Photo #5
Note: Small coil within Larger coil

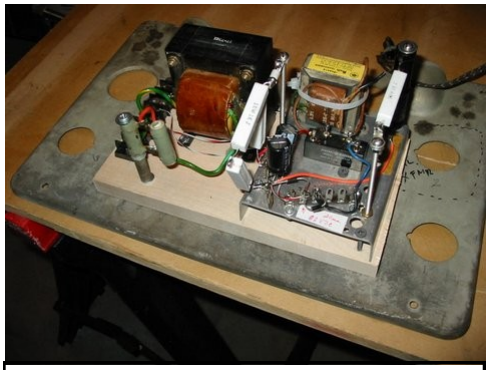


Photo #6
New Power Supply Sub-Chassis

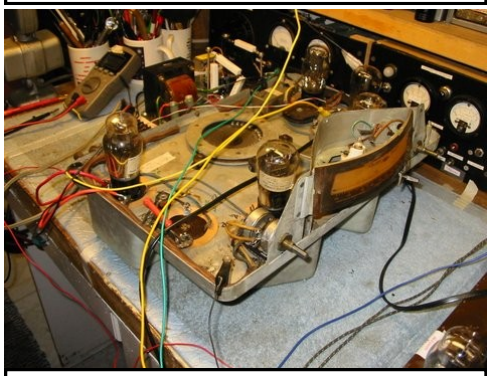


Photo #7
"Bread-Boarding RE-45 Chassis to new power supply

Photo #8
Reassembly of wood escutcheon after modification

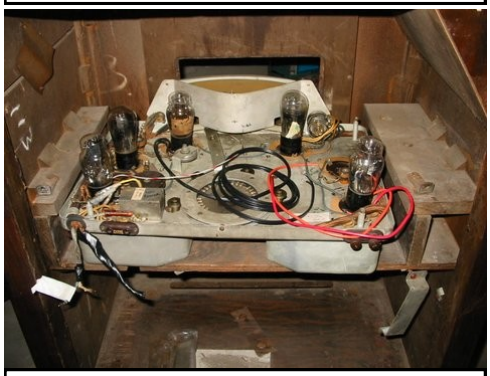


Photo #9
One of many fit checks

Photo #10
Final Prototyping of Entire System

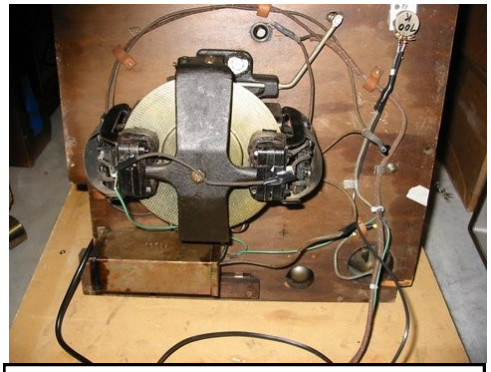


Photo #11
Underside of Phono with new wiring and volume control

Photo #12
Topside completed/modified Radio Chassis

Photo #13
Cabinet Modifications

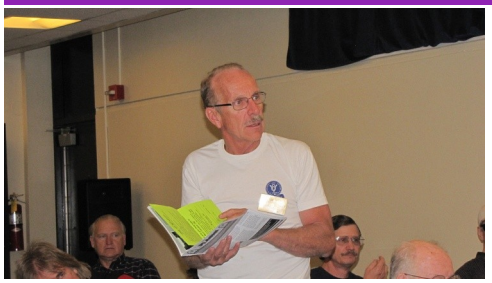
Photo #14
Final installation of Radio & Phono. Amp. & Speaker below. Interconnections not cabled yet.

Photo #15
Completed. Customer must finish dial escutcheon to proper darker brown.

CRC AUCTION

September 29th

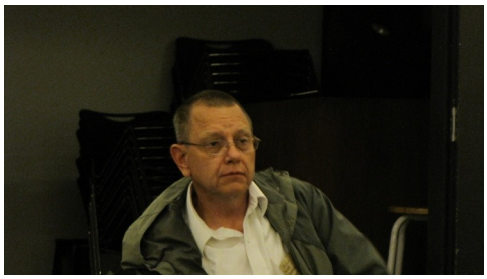
Photos from March 10th Meeting at the Miller Library in Castle Rock



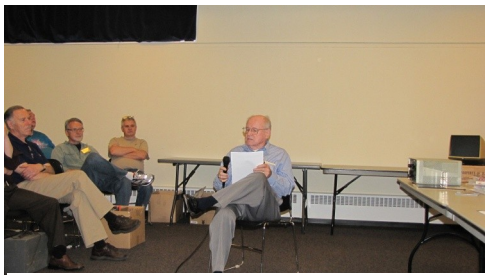
Marty Philips talks about Charlie Brett

Jim McCutcheon tell of his research for printing the Flash in color

Dave Boyle goes through raffle items



Scott Thomas volunteers to handle future book sales



Barney Wooters tells about working for Collins Radio

Tom Pouliot withB-17 radios BC-317 & BC-358

Don Andrus with Edgar Bergen art display

Bill Harris with Philco 42-KR3 wood radio to sit on Refrigerator

Tom Zaczek with Emerson Battery Tube Radio

Marty Philips with Crosley Bull's-eye radio

Wayne Russert with Mitchell Bed stand radio

Dave Boyle with Zenith Boomerang radio

Yuriy Yedidovich with1950 Silverstone clock radio

Good turnout for meeting

Club officers hard at work

The Open Trunk

Member submitted advertisements

WANTED: Buy/Sell/Trade: "Heavy Metal" communications gear, telegraph related items, vintage calculators & microphones.
Robert Baumann, 303-988-2089
HQ180A@aol.com. (07/09)

REPAIR SERVICE:
Radio repairs for club members. Reasonable rates. Good references.
Call David Boyle
303-681-3258 11/09

For Sale: by Dave Boyle
All the following instruments have been completely refurbished, repaired as needed, and calibrated (unless otherwise stated.)
Most have manuals and test leads.
Prices may be negotiable.
1) Eico Capacitor Tester, Model 950 , also tests for leakage and resistance. $63.00
2) Knight Tube Tester, ModelKG600 Not checked out, sold as-is. $20.00
3) Eico 5inch oscilloscope, Model 425 Completely gone-thru, new hi-voltage caps, all out of spec parts replaced, **NEW CRT**!, etc. $68.00
4) Eico "Professional" VTVM.6 inch wide meter. $45.00
5) RCA Institute RF Signal Generator All standard frequency ranges and 400 Hz audio frequency too. $30.00
6) Heathkit TV Alignment Generator, Model IG-52. $55.00
David Boyle, 303-681-3258

Philco Model 91 *complete working* radio chassis with two good speakers and a working tuning shadow meter! One 8 inch and one 12 inch. Call for negotiable price.
David Boyle, 303-681-3258 3/10

Wanted: 1920's Wooden Horn Speakers and a Crosley Musicone Speaker.
Also 1920's battery sets, especially Neutrodyne sets, Pre 1930 AC Radios and a Crosley Widget Console Radio
Michael O'Leary 602-354-7011
moleary9@cox.net.

WANTED: To buy: 1948 Motorola 5A9B portable radio, Maroon color. Good condition only.
Dewey Reinhard 719-596-5516
deweyfly30@gmail.com
WANTED: Broadcast or recording mics, especially from 20's to 1950's.

Shirt pocket transistor radios, working or not.

NBC chimes, all eras.

Tom Keeton 303-797-8073

For Sale
Arvin 341-T
Loose coupler 18" X 6"
A/K horn speaker Mod H ... very good shape RCA Tapestry Speaker Pathe Cone Speaker
books:
Bunis Collectors Guide edition 1
Bunis Collectors Guide edition 2
Bunis Collectors Guide edition 3
Radio Horn Speakers Floyd Paul
Crystal Clear vol 1
Crystal Clear vol 2
70 years of Radio Tubes & Valves
Reissue March 1938 Radio Craft
Philco Radio 1928-42
Classic Combs Buford and Jane Chidester
Zenith Transistor radios
Call Wayne Gilbert 303 431 6774

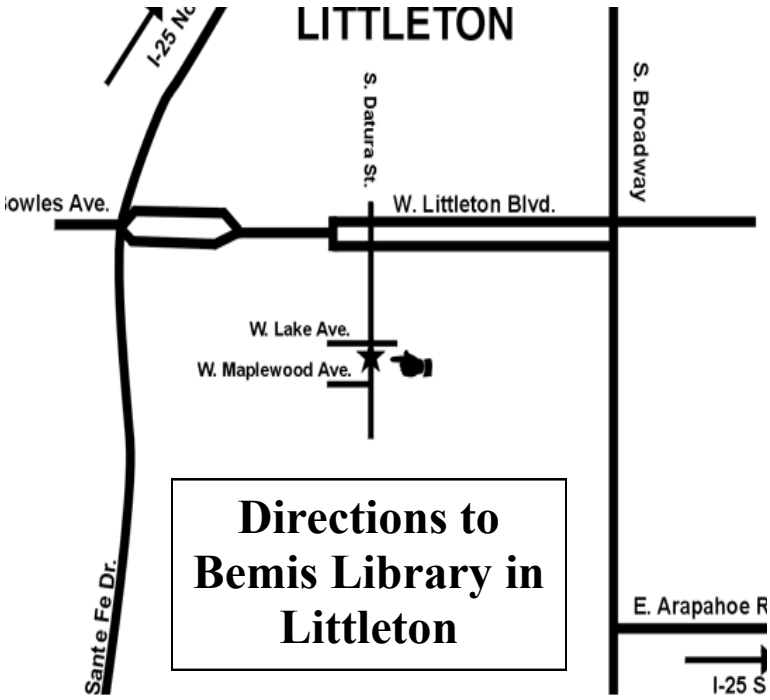
For Sale; Philco 37-116 works has low hum; Philco 37-675 lights no sound, RCA 9K Superheterodyne works good, GE Radio Phonograph Comb 11 radio makes noise record player does not work, Majestic Model unknown but all there chassis # 4810 , Zenth 6-V-27, Midwest Tomestone (Battery powered) model unknown, Delco R 1132 work but needs work on push button controls. Two T V and Radio repair Suitcases one has the Sylvania logo on it the other has no markings. Most of the cabinets are in pretty nice shape but would still need to be refinished. Both are full of Tubes and small test equipment. Many other big older tubes but sure some of them are no good. I have a couple of small boxes (around 50 per box) of smaller Tubes all in original boxes my guess these are more then likely good. There are a few Military Tubes in them. I'm down sizing and need to get some of these moved. Any reasonable offer on all or individual pieces will be considered. For pictures e-mail me at djclark@bbc.net <mailto:djclark@bbc.net> or call 308-760-4094 cell, or 308-762-8048. Dennis Clark Alliance, Nebraska

SUBMISSION OF ARTICLES &AND ADVERTISEMENTS

Classified Ads for The Open Trunk and articles of any radio/electronic or historical related subject to be published in the Flash are encouraged and welcomed. The article(s) should be submitted in Microsoft Word, RTF, or as text cut/paste into your email. Submit to Steve Touzalin by email at: stevetou@comcast.net or by postal mail to 417 So. Queen Circle, Lakewood CO 80226.

Formatting isn't necessary, but if you do, set the font to Times New Roman, size 10, left justified. If you have graphics (.jpg files) to be inserted, please name them and be specific about how you would like them placed. We will do our best based on space limitations.

The July14th, 1:00 meeting will be at the Miller Library in Castle Rock



Directions to Bemis Library in Littleton

Directions to Miller Library in Castle Rock

From I-25: Take the Plum Creek Parkway, exit #181.
Turn East onto Plum Creek Parkway.
Turn Left (North) onto S. Wilcox Street and continue north 2 tenths of a mile.
The Philip S. Miller Library is on the east side of the street at 100 S. Wilcox St.
The building is towards the back of the parking lot, past the Dairy Queen.

Colorado Radio Collectors
Antique Radio Club
417 S. Queen Cir.
Lakewood CO 80226

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