



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

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Restoring a DeForest F-5 By Wayne Gilbert, CRC member

Few radios merit having two articles written about them, and the only justification for a second article about the DeForest F-5 radio is that this article is primarily a restoration¹ article about this radio, whereas my prior article dealt with the F-5's history.

The DeForest F-5 radio has been described as one of the "last of the last," that is, it was one of the last DeForest radios manufactured by the DeForest Radio Telephone & Telegraph Company, which was one of the last of many US radio companies to bear the DeForest name. Ironically, and in reality, the F-5 was designed by a

DeForest employee, Roy Weagant, not Lee DeForest himself.

of it. After all, just recently, Weagant had been a pain in DeForest's backside when he attempted to circumvent DeForest's triode patent. (Weagant had produced a triode with its grid wrapped around the outside of the tube, and although unmarketable, it was a distraction that had cost Lee DeForest large legal and court fees.)



Weagant's motives for leaving a good job with RCA to take a job in a failing DeForest company is also vague. Perhaps he believed this was an opportunity to enhance his radio prestige, or perhaps he was just another somewhat sleazy character attracted to DeForest's flamboyant marketing ways.

One of Weagant's first moves as a DeForest Radio Company executive was to replace the models being sold with three typical 5-tube TRF radios, the W-5 and the W-6, and the lower cost, and more economical F-5.

To keep manufacturing costs of the F-5 at \$110 or less, it was housed in a leftover D-17 radio cabinet, and

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By 1924 the DeForest Radio Company² was rapidly deteriorating into just another of Lee DeForest's failed companies, with Dr. DeForest searching for someone to take over the operation of the company so he could devote all of energies to his latest scheme to get rich, in the new movie industry. DeForest felt the new movie industry's 'money is no object, let's just do it' attitude suited his personality more than the staid day-to-day struggles to make his last radio company profitable.

DeForest's choice of Roy Weagant to take over operations of the company showed just how eager he was to be rid

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COLORADO RADIO COLLECTORS ANTIQUE RADIO CLUB

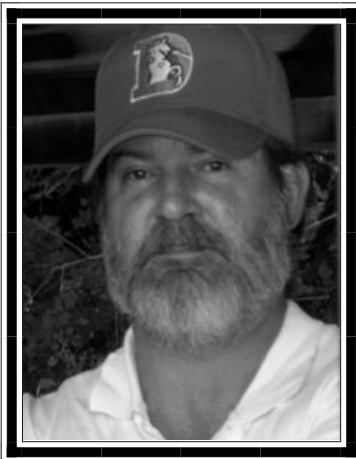
Founded October 1988
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Message from the President

WOW! and I mean **WOW!**

seems like a great match up.

What a great show. Dozens of members participating, bringing in their most prized, and in some cases their most obscure treasures. I think it's safe to say there was something new for all of us to see.



Special thanks to Dana Cain, Peter Illig, and Larry Weide. Also kudos to Bill Busch, Marty Phillips and Merrill Campbell for capturing our "Best of Show"

awards, and to all who participated.

More impressive to me were the hundreds of people who came by to view our show. I heard an estimate of over 1,000 people in attendance. Our association with "Vintage Voltage" sure

Hope to see you all at the May 17th meeting at the Bemis Library in Littleton.

Brian Hagrman

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Upcoming Events

5/17—CRC meeting in Littleton

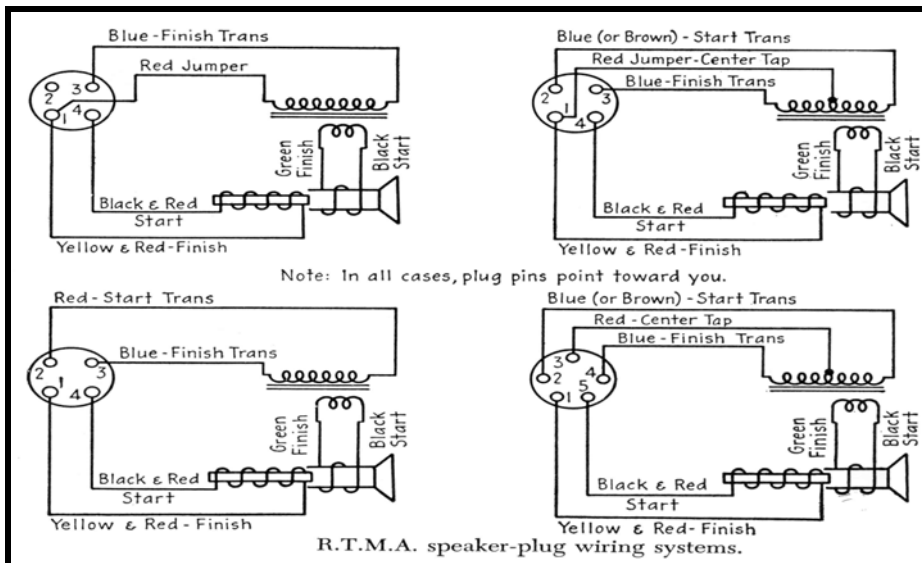
7/12—CRC meeting in Castle Rock
9/TBD—CRC Auction in Wheat Ridge

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 \$12. New memberships will be prorated to the following June.

CRC MEETINGS

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



(Continued from page 1)

used many leftover components available from other discontinued models, a situation that was quickly apparent when attempting to trace the radio's circuit using the published schematic.

My F-5 had last been shop-repaired in Hasting, Nebraska, in 1932 and probably replaced by a better, more modern radio soon after that. The years of abandonment and neglect as a junk-box radio had loosened many solder joint connections and dirtied most contacts; and something had been dropped on one tuning cap, bending and shorting its rotors and stators. Both of the audio interstage transformers had an

open winding, the failure that may have relegated the radio to the junk heap, where it had provided some young radio novice with a hands-on radio repair experience before it was deemed to be totally trash, and left for a radio collector in the next century to restore.

This radio was originally sold with DeForest DV-5 triodes, tubes with an yttriated oxide-coated filament, a filament coating said to use less current and therefore advertised to extend the life of the radio's A batteries. These tubes were tipped, with a ceramic base, making them appear to be more reliable than the more modern Bakelite based, bottom sealed tubes being used in other 1920s radios.

The claim that the original DeForest tubes would 'play better at a lower voltage' may have been more than a marketing ploy, as it was found that the

filament voltage was very critical to this radio's performance. Even a slight reduction of filament voltage below the two volts recommended for the type 30 replacement tube we used³ would prevent the radio from playing at all, and

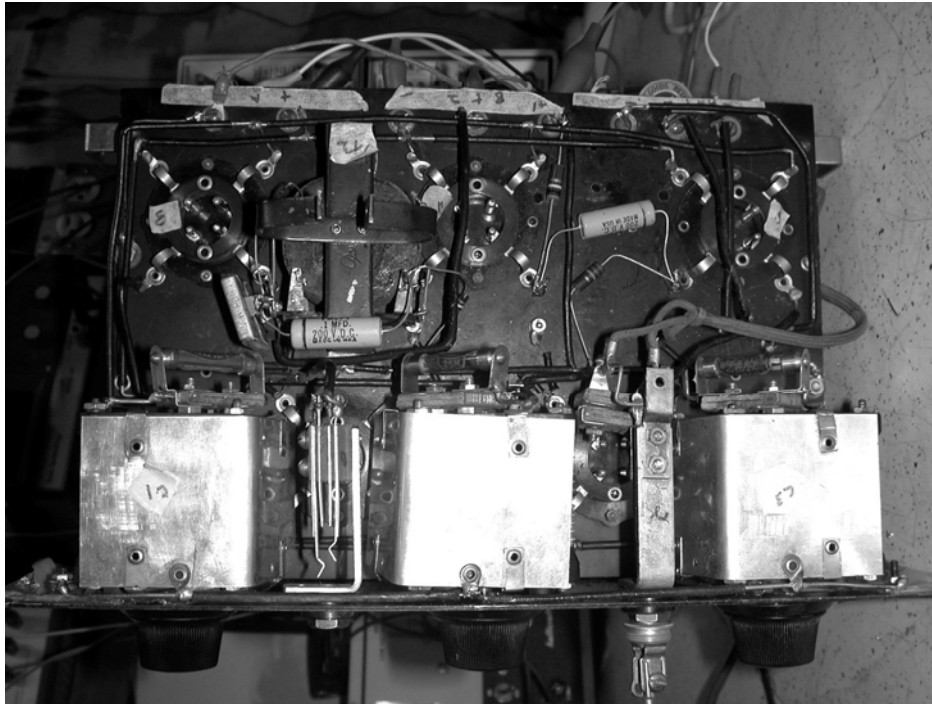
were found to make the radio perform better and with less audio distortion than when the audio transformers were in the circuit.⁵

The use of various C voltages did not seem to significantly affect the performance of this radio, when the A and B voltages were adjusted correctly. The specified detector stage plate voltage was 22 volts, but performance seemed to improve when this plate voltage was increased to 45 volts. Likewise, increasing the B+ on the other tubes seemed to reduce the gain of the radio. And again, the filament voltage was very critical, as it must be maintained at an even two volts (if type 30 tubes are used) for the radio to perform at all.

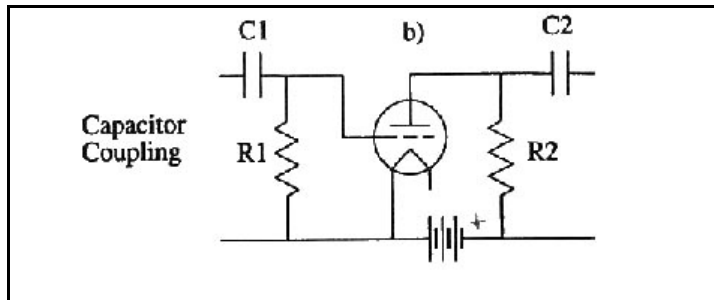
The original construction of the radio included a pair of neutralizing capacitors not shown on the schematic. Adjusting these did improve the performance of the radio.

In summery it must be said that this radio's combination of loose solder joints, dirty contacts, along with some failures of workbench equipment created a 'perfect storm' of restoration problems. Many times, many more times than any would want to admit, one of us would gather the group to demonstrate his prowess of radio repair, only to find that the radio would not play at all when power was applied. It was only when we finally learned to monitor the filament voltage very closely with an external voltmeter,

(Continued on page 4)



it's suspected that the original tubes' filament voltage would also have had to be very closely monitored to keep the radio playing properly.



Since exact replacement interstage transformers are not available, the commonly available universal ones were substituted in the initial restoration of this radio. These performed acceptably, although there was a noticeable distortion in the audio that could not be corrected. The interstage transformers were replaced with r/c coupling circuits in the final restoration steps⁴, which

(Continued from page 3)

after we had cleaned ‘the last possible’ bad contact, and re-soldered the final bad solder joint, did we finally get this radio to repeatedly power up and play. Even then tuning was found to be more successfully accomplished by pre-setting the tuning capacitors to a known local station’s frequency with a signal generator, instead of blindly trying to locate the station with the tuning dials.

The overall impression of this radio varies from person to person for those who were closely associated with its electronic restoration. Some voiced the opinion that it was “about as good as any” radio of that era, while I was personally left with the feeling that this is a very temperamental radio to both restore and to play. Perhaps better documentation would solve some of the temperamental problems encountered with restoring this radio, but it would have been a challenge to tune and play for anyone without a lot of patience. My final judgment is that this radio seems to have been just another of the less-than-advertised products of the DeForest legacy.

Note:

It was a joy to explore this radio with **Rich Kuberski**, before we had to finally turn it over to **Larry Weide**, the acknowledged Big Gun of Repairs in our small group. Without his hours of devoted work, this radio would never have been completely electronically restored. And without the gentle, yet professional, touch of **Bob Stutsman**, who brought back the original beauty of the cabinet and the luster of the front panel, this radio would not be the museum-quality radio that it is today. **Bill Dial**’s efforts contributed to correcting the electronic shorts in the tuning capacitors, and also thanks to others who contributed valuable suggestions and knowledge.

¹These notes apply to my DeForest F-5 and may not be applicable to others. I would also like to point out that in this case, the term *restoring* means less than returning this radio to its original condition, as some malfunctioning original parts are not feasible to replace



in kind, and were replaced with more modern parts and/or mini-circuits.

²The DeForest Radio Telephone & Telegraph Co. seems to have referred to itself as the DeForest Radio Company when it chose to use the shorter name.

³Type 30 tubes were used in the restoration process of this radio, and al-

though these tubes have been found to work well as replacements for 01A’s in other radios, they may have contributed some difficulties in the electronic restoration of this particular radio.

⁴ Replacing these transformers with a R/C circuit was my decision, over the objection of those who felt that original replacements should be acquired, or failing that, at minimum the universal transformers should be retained and painted black.

⁵ The value of the caps used were .1uFd, and the plate load resistors ranged from 100k to 220 k

Sources:

Douglas, Alan. Radio Manufacturers of the 1920's, Vol 1, pgs 171-182.

Sonoran Publishing LLC, Chandler, AZ. 1995.

The Saturday Evening Post:

Advertisement, November 1925.

Tyne, Gerald. Saga of the Vacuum Tube, pg 301. Howard W Sams & Co, Inc, Indianapolis, Ind.

Stokes, John. 70 Years of Radio Tubes and Valves, Second Edition.

Pg 31, 165-188. Sonoran Publishing, LLC, Chandler, AZ. 1997.

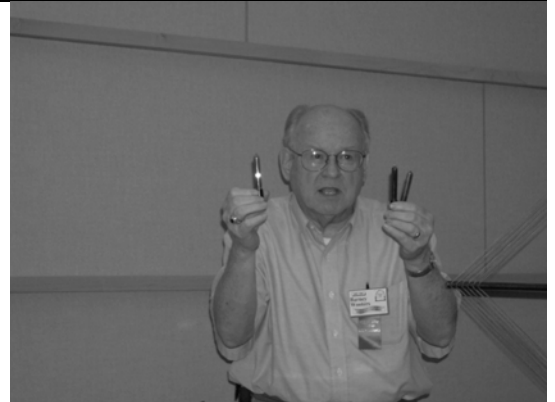


WWII Vargas Girl—Dec.1944

Photos from the March 8th CRC Meeting in Castle Rock



Tom Pouilot talks about radio kit bought in 1994 & recently restored.



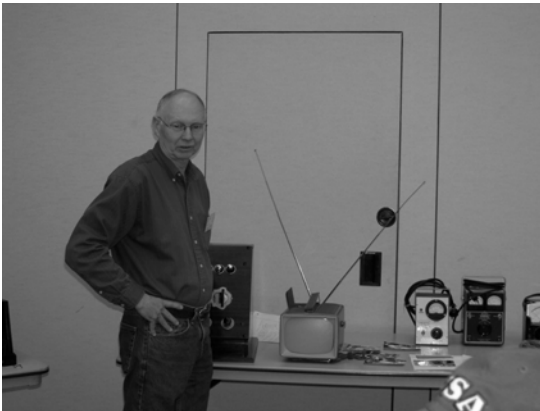
Barney Wooters AK-812 Tune-A-Light. Tuning indicator lamps from the mid 30's



Dave Boyles describes his restoration of Radiola 20 panel from a 1927 console

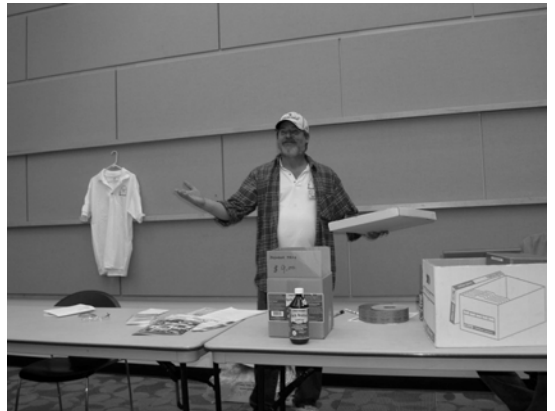


Radio repair class in session.



Bill Harris describes his 1956 RCA T.V.

Brian Hagrman hawking raffle tickets



Below left:
Barney Wooters RCA Dealer display tube.
Center: examining raffle items

Right: Merrill Campbell's 1949 Motorola 660 Automatic radio



Photos from the March 29th CRC Annual Show



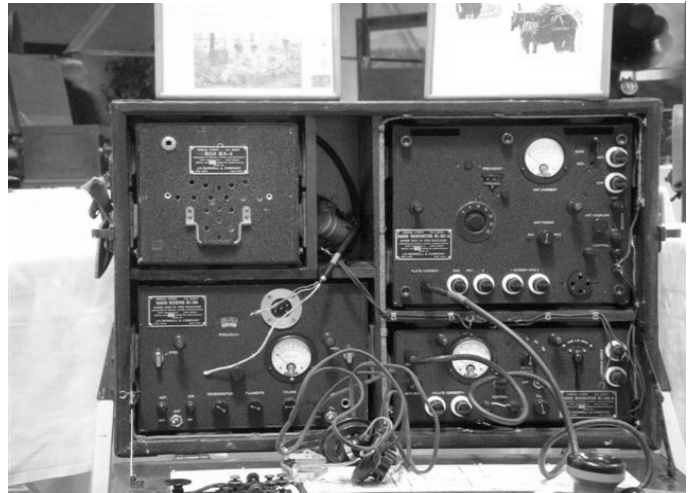
Results from the 2009 CRC Show

Accessories									
Rich Kuberski	Supreme Analyzer Set 56 1929	485 1st	Merrill Campbell	Motorola 51MIU 1951	405 2nd				
Bob Jensen	Eveready Thermometer 1940	480 2nd	Merrill Campbell	Motorola 5A9B 1948	365 3rd				
Travis Ogden	Signal Electric M110 Telegraph Set 1925	430 3rd	Novelty - Transistor						
Jerry Tynan	Radio-Lite-Tenna	430	Bill Dial	Iron Horse 1964	450 1st				
Dan Busetti	Majestic Manuals	335	Jerry Tynan	Telephone 205 1970s	360 2nd				
Travis Ogden	Westinghouse PC Meter 1925	330	Merrill Campbell	Ballantine's Whisky Bottle	350 3rd				
Bakelite			Mary Phillips	Finia Oilcan S8008F 1970s	320				
Steve Touzalin	Delco R-1235 1946	450 1st	Novelty - Tube	MacDonalds French Fries 1980s	290				
Mike Phillips	Arvin 451T 1950	420 2nd	Mary Phillips	General TV 534 Piano 1939	340 1st				
Jerry Tynan	Sparton 5AW06 1947	420 3rd	Plastic - Tube	Olympic 7-421W 1949	420 1st				
Jerry Tynan	Belmont 6D11 1946	410	Bill Dial	Zenith 6-G-60 IM 1941	470 1st				
Jerry Tynan	Silvertone 3461 1940	410	Portable - Post 1938	FADA P80 1947	455 2nd				
Bill Kohl	Philco 53-563 1953	395	Merrill Campbell	Motorola 55L 1946	270 3rd				
Bill Dial	Brewster 91084 1946	380	Bill Dial	Leutz C 1924	460 1st				
Bill Harris	Zenith 5R3212 1938	375	Mary Phillips	Atwater Kent 9 1923	355 2nd				
Mark Kuligowski	RCA 65X2	370	Barney Wooters	Atwater Kent 20 1924	355 3rd				
Jerry Waterman	Delco 1230 1947	360	Travis Ogden	Freshman Masterpiece 1924	330				
Merrill Campbell	Westinghouse H126 1945	355	Jerry Waterman	Crosley 51 1924	305				
Mary Phillips	Crosley Clock radio D25 1951	325	Mark Dittmar	Grebe CR9 1921	300				
Jerry Waterman	RCA 45X-11 1940	320	David Boyle	Edison Phonograph Standard 1910	290				
Battery - 1926-1929			Bob Jensen	RCA 103 1926	330 1st				
Bill Dial	King Mfg. 80 Baronette 1927	390 1st	Speakers	Atwater Kent H 1924	275 2nd				
Rich Kuberski	Atwater Kent 49 1929	325 2nd	Jerry Waterman	RCA 8PT7030 1956	420 1st				
Catalin			Jerry Waterman	Crosley TV 10-428MU 1950	385 2nd				
Cathedral			Bill Harris	Kennedy 42 Coronet 1931	480 1st				
Barney Wooters	Fada 652 1945	430 1st	Merrill Campbell	Zenith S330 1938	355 2nd				
Jerry Tynan	RCA 143 1934	430 1st	Jerry Waterman	Admiral 551 1936	350 3rd				
Jerry Tynan	Philco 90 1031	380 2nd	Transistor	Zenith 6S229 1937	345				
Bill Harris	Delco 20 1930	350 3rd	Bill Harris	RCA ITPIE 1961	380 1st				
Jerry Waterman	Philco 70 1931	330	Jerry Tynan	RCA 3RG14 1962	350 2nd				
Jerry Waterman	Philco 60 1933	295	Mark Kuligowski	Columbia 1961	345 3rd				
Communication Gear			Tube/Parts Display	Lafayette FS-91 1961	300				
Bill Busch	Military Mule Radio SRC178 1936	450 1st	Bob Jensen	Clapp Eastham Cambridge 1915	405 1st				
Robert Baumann	Electronic Keyer Display	410 2nd	Merrill Campbell	RCA UR-542 1919	355 2nd				
Mark Dittmar	National SW-3 1933	380 3rd	Bill Busch	Klystron Oscillator	290 3rd				
Bob Stutzman	RCA Radiomarine AR 8712	345	Wooden - Line Powered	Brunswick 5KR 1927	340 1st				
Bill Busch	Heathkit Mohican Receiver 1950s	285	Bill Dial	Automatic 660 1947	325 2nd				
Console - Full Length			Merrill Campbell	Brunswick 5NO 1928	310 3rd				
Mary Phillips	Majestic 20 Grandmother 1932	445 1st	Rich Kuberski	Silvertone 6263 1939	260				
Rich Kuberski	Zenith 12H93R 1946	375 2nd	Mary Phillips	RCA T65 1940	235				
Mark Kuligowski	Zenith Console 1940	325 3rd	Note: In the case of a tie vote, the winner was decided by a coin toss						
Console - High/Low Boy			Manual Voting:						
Larry Weide	Silvertone 112 1930	395 1st	- Bill Busch, Military Mule Radio SRC178 1936						
Crystal Set			- Marty Phillips, Majestic 20 Grandmother Clock 1932						
Bob Jensen	Jecophone Jr. 1925	470 1st	People's Choice - Merrill Campbell, Zenith S330 1938						
Robert Baumann	Knight Kit 1964	370 2nd							
Homebrew, Kit - Specialty			Best of Show - Bill Busch, Military Mule Radio SRC178 1936						
Tom Poulit	Early Superhet Display	450 1st	Best Restoration - Marty Phillips, Majestic 20 Grandmother Clock 1932						
David Boyle	Homebrew Radio Kit 1927	445 2nd							
Bill Busch	Heathkit Calculator 2008 1972	405 3rd							
Steve Touzalin	Archer AM Kit 28-4029 1982	375							
Mark McKeown	Homebrew Receiver 1923	370							
Travis Ogden	I Tube al Crystal Set	360							
Rich Kuberski	Bremmer Tully Nameless 1923	360							
Mark Dittmar	Regenerative Receiver 1925	335							
Rich Kuberski	Homebrew Receiver 1920s	320							
Mark Kuligowski	Kit Radio	220							
Metal Case									
Steve Touzalin	Sparton 6A66 1946	425 1st							

Best of the Best from the 2009 CRC Show



Best Restoration: Majestic 20 Grandmother Clock 1932 Marty Phillips and sons.



Best of Show: Bill Busch—SRC179 1936—Military “Mule” Radio



People’s Choice: Merrill Campbell—Zenith S330 1938



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. (05/09)**

FOR SALE:Note...All of the instruments listed below are refurbished, repaired and VG.

Heathkit 5" oscilloscope, #0-12, built by myself, perfect for radio repairing..

\$30.00 OBO

RCA # W-44 audio generator, sine and square wave. Like new **.\$30.00 Firm Superior # TV-50,** Radio and TV signal generator. VG, calibrated,

\$50.00 OBO

BK model # 606, tube tester, also calibrated per manual, VG,.....**\$40.00 OBO**

VOM looks like a typical Triplett or Simpson from the 1950's. Much newer of Japanese Mfg. VG with leads, and great black handled case..**\$28.00 OBO**

Accurate Instrument Company;

Utility Tester for radios, home appliances, etc. Can test 1950's era tube filaments (4 different sockets plus a B/W TV CRT socket on long leads)..

Has ability to test ac and dc volts, resistance, amperage----everything for the home appliance. Quite a post war collectable that has the test leads, manual, all in a nice case! Great for the garage work bench---teach your wife to use it!.....only **\$11.00 OBO**

David Boyle 303-681-3258
03/09

REPAIR SERVICE:

Radio repairs for club members.
Reasonable rates. Good references.
Call David Boyle
303-681-3258 12/08

FOR SALE: DeForest F-5 radio. This radio has been restored/repared to play well. It will be sold w/o tubes, but will include an untested DeForest DV-5 (short pin, ceramic based, tipped) tube that came with the radio, and an original Deforest Radio Company stock certificate.

I wrote an article about the history and manufacture of this radio in Nov 2002. This article and pictures of the radio and the stock certificate can be seen at the following address.

<http://www.nazcaresources.com/waynewrites/F5%20from%20front.jpg>

<http://www.nazcaresources.com/waynewrites/stock%20certificate2.jpg>

<http://www.nazcaresources.com/waynewrites/nov%202002%20article.jpg>

Please call or email me for further info, including price, delivery, etc. The sale of this radio will be to the first person who responds with payment.

Wayne Gilbert, 303-431-6774
wagil@aol.com 03/09

WANTED: I need a couple of station selection push buttons for a Zenith '41 console.

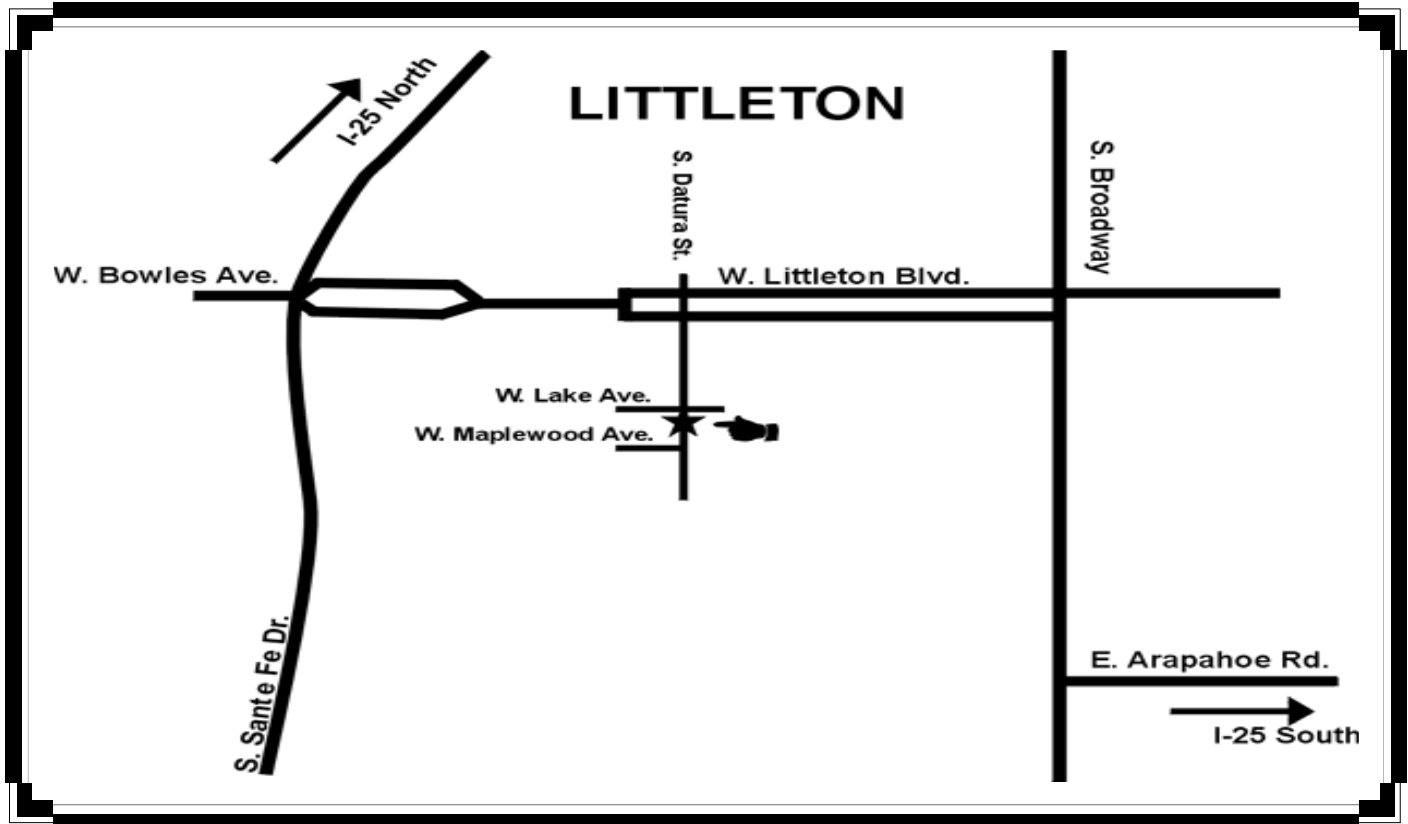


Larry Weide (303) 758-8382
lweide@msn.com 12/09

PLAN TO ATTEND

Another basic radio repair workshop is planned right after the May CRC meeting in Littleton. It will provide hands-on instruction of basic radio troubleshooting, this time focusing on the alignment of a radio receiver. Anyone interested is encouraged to bring a meter (VOM), with test leads, to use or for others to use. Either digital or analog is ok, whatever you have. Also we will need a few radio chassis's that are working, to be alignment "subjects". To keep the instruction at the "basic" level for all attendees please bring only a low tube count radio such as an All American Five from the 1940's or early 1950's. If you do bring a radio chassis please bring along a schematic for the subject radio. We will need to know the IF frequency for the receiver. There was a large turnout for the last workshop, with lots of information for those just starting to work on their own radios, and lots of new ideas for those more experienced in radio repair. This will again be a perfect chance to participate, have fun, and learn!!!

The May 17th, 1:00 pm meeting will be at the Bemis Public Library in Littleton



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

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