



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

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November/December

# What is this thing we call a radio?

By Larry Snyder

A radio is a device, which receives the wireless transmission of electric impulses by means of electromagnetic waves and transforms those signals into audible sound. The frequency of radio waves is between 3,000 and 300,000,000,000 cycles per second (cps). That's up to 300 gigahertz. RF or Radio Frequency waves travel at the speed of light (186,000 miles per second) for astronomically large distances and can penetrate non-conductive materials.

This paper covers the AM broadcast range of 500,000 to 1,750,000 cps (500 kc to 1750 kc). It will use a crystal radio circuit to illustrate basic radio features. Radios have evolved from, and greatly improved upon, the simple crystal radio, but the basic elements have remained. Sound waves that can stimulate the human ear and brain to the sensation of hearing generally range from 20 cps to

about 20,000 cps. This is called the audio range. 20 cps is a deep bass sound and above 15,000 cps is considered a shrill sound.

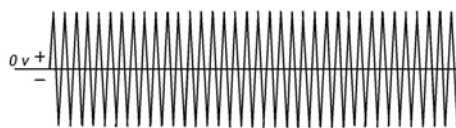
To understand how our radios work we must first understand how the radio wave is generated and transmitted from the radio station. When the announcer speaks into the microphone, or the live band plays into a microphone, a fluctuating DC current in the audio range is generated as shown in the Graph A.



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Graph A - Audio Frequency of speech or music  
20 to 20,000 cycles per second

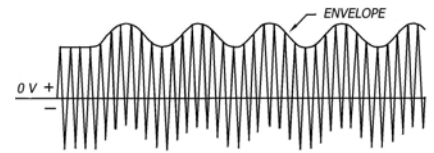
In addition to the audio signal, the radio station is also generating its own unique transmitting frequency to distinguish it from all other stations. There are more than 40 radio stations transmitting in the Denver area; KRWZ at 950 kc, KEZW at 1430 kc, and KEPN at 1600 kc, are a few. The station transmitting frequency is depicted in Graph B.



Graph B - Broadcast Radio Frequency  
500 kc to 1750 kc

The actual signal transmitted from the radio station is the combination of the Audio Frequency and the Broadcast Radio Frequency mixed together. Graphs A

and B are added together and shown in Graph C.



Graph C - Transmitted AM Radio Wave

Note that the audio and broadcast frequencies have been combined and the envelope of the resulting Amplitude Modulated (AM) wave is the same shape as the audio frequency wave. It is this AM Radio Frequency (RF) wave that our broadcast radio receivers convert back to the audible sound that we can hear and enjoy. (In FM radios the radio wave is Frequency Modulated instead of being Amplitude Modulated but that's another story.)

Every radio from a simple crystal receiver to an AM/FM & short wave receiver contains these four essential systems.

- 1) The **antenna-ground** system which collects all radio waves passing by it
- 2) The **tuner** which selects only the desired station while rejecting all others
- 3) The **detector**

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# COLORADO RADIO COLLECTORS ANTIQUE RADIO CLUB

Founded October 1988  
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## Message from the President

Well ... we did it again. Another very successful autumn auction.

Those of us that were fortunate to attend all seemed to have a grand time and most walked away with some great deals.

The attendance was great with nearly 90 people, the food was great, and the weather co-operated beautifully. (I'll admit to concerns I had a few days before).

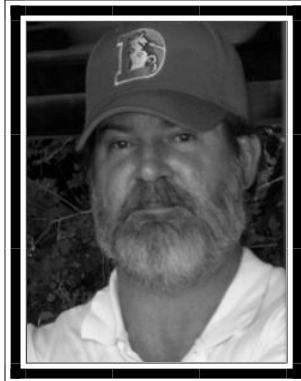
Special thanks go out to several

people, our auctioneer Tom Pouliot, IT gurus Larry Weide and Rich Kuberski, our chef Dave Boyle amongst the all too many to list that made this thing go off like clockwork.

Our next meeting will be November 8<sup>th</sup> at 1:00 PM at the Library in Castle Rock.

Hope you all can attend as there will be a special announcement regarding the January meeting

Brian Hagrman.



## CRC CONTACTS

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## Upcoming Events

- 10/31—Halloween
- 11/8—CRC meeting in Castle Rock
- 11/26—Thanksgiving
- 12/25—Christmas
- 1/1—New Year's
- 1/10—CRC meeting in Littleton

## 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 1:00 pm. The meetings consist of business, "show & tell", raffles, auctions, swap meets, technical discussions and other subjects of interest

**\$150,000,000 Worth for 50¢**

Over The Roof of Your Farm Dwelling Drifts 150 Million Dollars Worth of The World's Greatest Entertainment Every Year—Now YOURS for only 50¢ A Year Power Cost With THE NEW 1937 ZENITH FARM RADIOS NOW AT YOUR DEALER'S

Over 200,000 pleased farmers and ranchers are now enjoying with their Zeniths what you are missing if you haven't tried. You owe it to yourself and children to get it now with a Zenith! Six months from today you cannot imagine the happiness you and your family have missed in programs of education, comedy, music and drama from the U. S., Europe, South America or the Orient which Zenith guarantees—everyday for your money back. Today, for 50¢ a year power cost, it's yours with a Zenith! See Zenith at Your Dealer's There are 25 different 1937 Zenith models to choose from from \$14.95 up to \$29.95. Choose the one that meets your power supply and your pocketbook. If you have no power use the new 1937 Zenith with original Windmiller. This is a year power operating set. If you expect power some day—make a Zenith set. Your Radio now, then, quickly convert it to power later. Have your dealer give you a FREE home demonstration of the Zenith. Learn how much you are missing. Don't miss your own set. Write Zenith—America's Most Copied Radio. ZENITH RADIO CORP., CHICAGO, ILL. For 22 years makers of the radio.

180 Lines Farm Papers, Feb. & March, 1937

## Meeting Locations

(Unless noted otherwise)

<b>Littleton</b>	<b>Castle Rock</b>
January	March
May	July
September	November

Another Zenith Tone Triumph!  
"TWIN COBRA" TONE ARMS

This Cobra is for the STANDARD RECORDS  
This Cobra is for the NEW LONG-PLAYING RECORDS

Enables you to enjoy Long-Playing Records, too ... as only Zenith can play them!

Tunes or 17! An entire symphony on a single disk—45 minutes of high-fidelity recorded music. And now Zenith enables you to enjoy this great innovation too—in its thrilling tone in the new console combination with the revolutionary "Twin Cobras".

This exclusive Zenith tone triumph incorporates two separate Cobras' Tone Arms. One is specially engineered to reproduce the new Long-Playing Records on the famous Zenith "radioic wave" principle. This Cobra is extremely light in weight, has a special style, and brings out the utmost in beauty and tone purity from Long-Playing Records.

The other tone arm is the world-famous standard Cobra, with Speed-Spread Record Changer, for playing regular records on a radioic wave. Eliminates noise and scratch, large records sounding like new for over 2,000 plays!

Already, the "Twin Cobras" is a sensation among America's music lovers. Hear it today at your Zenith dealer's—in a variety of stunning console models.

THE ROYALTY OF RADIOS! Over 20 Years of "Radio-ity" in Radio, Television, Also Makers of America's First Hearing Aid.

ZENITH RADIO AND TELEVISION

ZENITH RADIO CORPORATION, CHICAGO 27, ILLINOIS

# 2009 CRC Picnic/Auction

By Rich Kuberski

The 2009 Colorado Radio Collectors annual picnic and auction was another resounding success. It was held, once again, at the Tectonic Management Group office grounds in Wheat Ridge. The weather was perfect although by the end of the auction, storm clouds were beginning to gather.

As a result of a large influx of radios and equipment from Wyoming, the auction did run longer than it has in the past, but I never heard any complaints. There were plenty of radios to choose from and for the most part, it was a buyers market. Larry Weide did his usual magnificent job of providing computer services. For those of you

who don't know it, the auction program is custom written by Larry. It provides all the bells and whistles necessary to do all of the record keeping and calculations that make us all confident that the amounts given are accurate.

Chef Dave Boyles organized the food for the picnic. He and his burger flipping crew burnt the burgers and hot dogs to perfection and saw to it that no one went hungry. Thanks to all of you that brought side dishes to share. Those of us that did not enjoyed them all.

And then there is Tom Pouliot. With-

out his untiring efforts and superb skill as auctioneer, we would all be left to fumble through the process. Tom manages to give every item a positive spin and he does his best to squeeze out as much money as he can for each seller. He does this year after year and we all owe him, as well as all of the other volunteers that make the auction a success, a debt of gratitude. The hard work of a few people make for an enjoyable event for everyone. If you haven't been to a picnic/auction, you are missing one of the two premiere events sponsored by the club.

Don't miss the auction results and photos on pages 6-8.

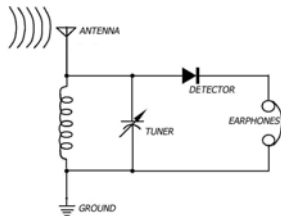
## What is this thing we call a radio? continued

(Continued from page 1)

which changes the selected radio frequency wave back into an audio frequency wave

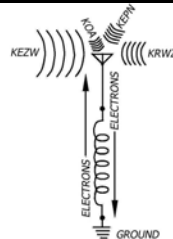
- 4) The *speaker* system which converts the audio frequency wave into sound

All these systems are illustrated in the following crystal radio schematic. Although it has many shortcomings, it is the simplest working radio and it will be used to illustrate how a radio works.



### 1) The antenna-ground system

All receivers must have an antenna. The antenna receives each and every RF wave that is powerful enough to



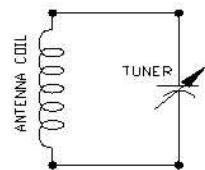
reach it. These waves may originate from local radio stations, foreign radio stations, satellites, the Mars probe, or distant galaxies. All these radio waves produce electrical voltages in the antenna ground system that surge up and down, from the antenna to the ground, passing through the antenna coil. There may be hundreds of RF waves on the antenna at any one time. Some may be too weak to detect. Others may be too high or too low of a frequency for our particular radio to "tune-in". But none-the-less they are all there.

Early antennas were usually an elevated copper wire, about 75 feet long, connected to the receiver by a lead-in wire. Later, when circuits and techniques improved, antennas were copper wire loops wound on a particleboard cover on the back of the radio.

*Ground* is an electrical term, and as

used in radio work refers to a part of the circuit that is directly connected to the earth or to the metallic chassis of the radio. Ground is considered to be at zero voltage and is the reference point from which most other voltages are measured.

### 2) The tuner circuit



All radio receivers must have some method of selecting the desired station's frequency and separate it from all the others that are acting on the antenna. This is accomplished with a tuner circuit. The radio waves flowing up and down the antenna ground circuit pass through the antenna coil which provides an electrical effect known as inductance (L). The tuner is a variable

(Continued on page 4)

(Continued from page 3)

capacitor that provides the electrical effect known as capacitance (C). When you turn the tuning knob on the radio you are adjusting the tuner or variable capacitor. The combined actions of the inductance (L), and the capacitance setting (C), determine the natural frequency of the tuner circuit. When the natural frequency of the tuner circuit is identical to that of the desired station they are said to be in resonance with each other and the signal is amplified. Since all other signals are not in resonance with the tuner circuit they are not amplified or passed along to other parts of the radio; hence, we do not hear them.

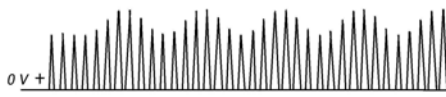
### 3) The detector



*Detector* is an electrical term for a device which changes the current from one type to another type. The detector only allows current to flow in one direction, blocking flow in the reverse direction. Early detectors, such as the one in crystal radios, forced the selected RF current to pass through the mineral *galena*. Later some radio tubes were designed to be detectors. In more modern radios diodes are used.

The blocking action of the detector changes the shape of the selected AM radio wave from that shown in Graph C to the one shown below.

Note the negative portion of the AM radio wave has been eliminated, but the envelope of the audio waveform is still



Graph D - The AM Radio wave after the Detector

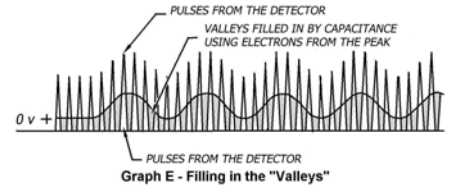
present. The wave in Graph C was an alternating current since it went both plus and minus. Graph D is a pulsating direct current with varying amplitude that represents the original audio signal. If the selected station frequency is 500 kc each pulse is only one-millionth of a second long followed by the next

one-millionth of a second with no current flowing. If the selected station frequency was 1500 kc each pulse is only one-third of one-millionth of a second long.

### 4) The speaker system

No speaker system or earphones can respond quickly enough to pulses of one millionth of a second or less. The key to changing the pulsating current into a continuous current is capacitance. The speaker coil windings have enough internal capacitance to store part of the pulse's supply of electrons and discharge them when there is no current flowing. In some radios a small capacitor is added for this purpose, but it is not always needed in crystal radios.

With the valleys filled-in the signal is a



Graph E - Filling in the "Valleys"

continuous and the original audio signal from the station is reproduced and heard as sound in the speaker system. Compare this to Graph A.

This information was extracted from



Graph F - The reproduced Audio Frequency signal

the first 100 pages of:

Marcus & Marcus, *ELEMENTS OF RADIO*, Fourth Edition, Prentice-Hall, Inc. 1959.

## The Italian connection

By Richard Kuberski

It's likely that if you attended the auction, you did not notice that we had a visitor from Italy. Some weeks before the auction, Bart Whitehouse sent me an email about a friend of his that is working here in the US on the Mars Obiter project. This gentleman is also very interested in antique radios. He is living in Boulder, but since he is just here for a few months he does not have a car. So, back to the email. Bart wanted to know if I could arrange transportation for Fabrizio to come to the auction. So, I contacted Don Andrus who lives in Boulder and he graciously agreed to bring him along when he came.

Needless to say, he was amazed at our proceedings, and of course, he bought a radio. One that was small enough that he could take it home in his luggage. He bought a Zenith Royal 7000 T.O.

I had only met Fabrizio for 20 minutes at the auction, but my wife and I invited him to dinner, and later, he came to visit me on a day that I was volunteering at the Colorado Rail Road Museum. It turned out that his "new" radio did not work. So after we met at the museum, we came over to my home and tore into

the radio to see if we could fix it. Well, with my less than expert help, we failed to get it working. By chance Barney Wooters had called me that same day so I asked him if he would tackle this project. He foolishly agreed, not knowing what he was getting to.

As Barney will tell you, this is a complicated radio, not meant for amateurs to work on. After his first 8 hours of working this radio he called me to explain that he had it working on FM, but thought that the AM section had a fatal flaw. That was the good/bad news. However, Barney did say that he wanted to sleep on it and look at it again the next day. Well, evidently a good nights sleep is just what this radio needed. The next day Barney found a defective resistor buried deep within the set and this was preventing the signal from passing through. When I told Fabrizio, he was thrilled.

By the time you read this, he and the radio will be back in Italy and our new friend will be telling this story to his friends.

(See page 9 for his response to this.)

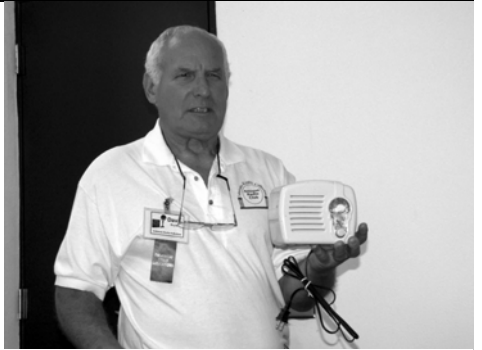
## Photos from September 13th Meeting in Castle Rock



Bill Dial cathode ray monitor—1946



Charlie's Bookstore



Dave shows Arvin Model #40



Ron with DC potentiometer



New Member: Joe Summers



Larry talks about auction procedures



Larry with oatmeal box radio



Mark with small aircraft radios



New Member: Paul Heller



Robert shows replacement radio backs



Tom with "new" vintage radio



William Hinkley with 1949 T.V.

# 2009 CRC Auction Results

4" Panasonic TV	\$10.00
Accurate Inst. 152 VTVM - Needs Battery	\$6.00
Admiral T-104 1947 - TV, works	\$20.00
Aircastle 32V Farm Radio 1936	\$30.00
Airline Radio	\$25.00
Airline 14WG-690	\$10.00
Airline 3 Dial TRF 1925	\$-
Airline 62564 - works	\$30.00
Airline TRF - no tubes 1928	\$25.00
Altec Lansing Speaker	\$70.00
ARC Mags Full year 1997, 98, 99, 2000	\$3.00
ARC Mags Full year 2001, 03, 04, 05	\$2.00
ARC Mags Full year 88, 89, 90, 91	\$7.50
ARC Magss Full Year 92, 94, 95, 96	\$2.00
Astron RS-35A 13.8/20A Power Supply	\$45.00
Atwater Kent 20 1925	\$110.00
Atwater Kent 37 1927 - Parts Radio	\$2.00
Atwater Kent 55 w/ E Speaker 1929	\$-
Atwater Kent 60C Kiel Table 1929	\$85.00
Atwater Kent 944 1934 - Works	\$110.00
B&K Transistor Analyst	\$2.00
Bell & Howell Digital Meter IMD-202-2 - Works	\$2.00
Belmont 71A 1932 - Very good condition	\$250.00
Bendix 526A 1946	\$50.00
Box Miniature tubes NIB	\$10.00
Box of larger transistor radios	\$20.00
Box of small transistor radios	\$60.00
Box Of Tubes NIB - apx 100	\$90.00
Box Of Tubes NIB - apx 100	\$25.00
Box Of Used Tubes - apx 100	\$25.00
Box Of Used Tubes - apx 100	\$20.00
Box Of Used Tubes - apx 100	\$100.00
Box Of Used Tubes - apx 100	\$25.00
Box Radios Qty 5	\$5.00
Box Radios Qty 5	\$30.00
Bulova 3302795 Works	\$30.00
Clarion Cathedral	\$7.50
Collins R105-A/Arr-15 - 550 on eBay	\$-
Coronado 1182 1948	\$5.00
Coronado 585C 1935 - Restored	\$65.00
Coronado Farm Radio	\$5.00
Coronado Radio	\$2.00
Crosely 516 1936	\$7.50
Crosely Cathedral cabinet	\$10.00
Crosley 184 1934	\$25.00
Crosley 52-TG 1941	\$10.00
Crosley 58TW 1948	\$5.00
Crosley 6516 1927	\$25.00
Crosley 9-121 1049 - Re-capped	\$2.00
Curtis Mathes KT330 1985	\$2.00
Del Monico PB-741 1960	\$2.00
Eico Tube Tester	\$50.00

Electronic Books 1920s - 50s	\$45.00
Electronic Magazines	\$65.00
Emerson 45 1934	\$-
Emerson 888 vanguard transistor	\$45.00
Franklin Cathedral 1935	\$50.00
GE 140 1951, metal case	\$5.00
GE 2418A Mickey Mouse	\$50.00
GE 66 1949	\$12.00
GE LC628 1941 - Restored	\$-
GE M-42 1934	\$25.00
GE ST-4A Sweep Gen.	\$5.00
General Tel 23A6 1947 - Plays, Distortion	\$30.00
Grebe, Philco Butterfly, Freshman	\$340.00
Grundig S02US 1957 - Works, Phono Svc Rqd.	\$5.00
Grunow 1067 1937	\$50.00
Guild 484 Spice Chest 1956	\$20.00
Hallicrafters S-38	\$30.00
Hallicrafters S-38, qty 2	\$25.00
Hallicrafters S-38, qty 3	\$70.00
Hallicrafters S-76 \$	40.00
Hallicrafters S-94, qty 2	\$20.00
Hallicrafters SX111 1960	\$-
Hammarlund SP-600 1951	\$220.00
Heathkit IG-4505 Oscilloscope Calibrator	\$5.00
Heathkit IM-17 VTVM 1967	\$2.00
Heathkit Oscilloscope 5 IO-18	\$5.00
Hickok 850 transistor checker 1958	\$5.00
Howard 901A 1950	\$2.00
Japanese Make radio 8V71A	\$7.50
Jewel 995 1950 - Works	\$10.00
Jewel Tube Tester	\$40.00
Kadette 86 1936	\$40.00
Kolster/Silvertone Radios	\$100.00
Lambda Power Supply 0-40V/17A	\$5.00
Lambda Power Supply LJS - 5V/16A	\$10.00
Lambda Power Supply LJS- 5V/16A	\$7.50
Magnavox AM Radio 1946 - works	\$2.00
Magnavox Wooden Console	\$50.00
Maguire 561DW 1946	\$7.50
Majestic 4705 1947 - Works	\$20.00
Majestic 8S452 - Restored	\$-
Military Radios Manuals, qty 7	\$15.00
Military Signal Gen. AN/urm-25 - works	\$40.00
Military Signal Gen. AN/urm-25, no work	\$15.00
Mirror Tone Plastic Radio 1940s	\$15.00
Misc parts	\$5.00
Misc table radios, qty 4	\$40.00
Misc. Tube Radios	\$2.00
Miscellaneous parts	\$20.00
Nordmende Multiband radio - works	\$10.00
Philco 37-610 1937	\$7.50

# 2009 CRC Auction Results

Philco 37C 1932	\$15.00
Philco 38	\$20.00
Philco 38-12 1938 - Re-capped	\$60.00
Philco 38-60 1938	\$15.00
Philco 39-30 1939	\$25.00
Philco 39-70 1939	\$15.00
Philco 44 1933	\$65.00
Philco 46-1201 & 48-1201 - Lot of 2, not work	\$25.00
Philco 46-1201, qty 2 - needs parts	\$-
Philco 60 1934	\$-
Philco 60B 1934 - Excellent Cond.	\$75.00
Philco 66 1935	\$75.00
Philco 84 1934	\$35.00
Philco 90 1931	\$200.00
Philco 90 1931	\$40.00
Philco PT-12 1941 - Works	\$45.00
Philco Radio Tuner	\$25.00
Philmore 337 Little Wonder Xtal, w/box 1940	\$90.00
Pilot T-531 1947 - re-capped	\$5.00
Portable Radios, qty 5	\$5.00
Power-One Power Supply - 24/5V@7A	\$-
Precision App. E-400 Sweep Gen.	\$5.00
"Radiola 17 - works, no tubes"	\$25.00
RCA 121 1933	\$110.00
RCA 14-S-7063 1957, TV, works	\$15.00
RCA 3-BX671 1954	\$65.00
RCA MI-1317 1950	\$2.00
RCA Radiola 60 1928	\$30.00
RCA Table	\$5.00
RCA Victgor 118 1934 - Works	\$60.00
RCA Victor 15X 1940	\$5.00
RCA Victor 56X10 1946	\$10.00
RCA Victor 95T 1938	\$10.00
Realistic DX-150A	\$25.00
Riders Manuals - #5, 6, 9	\$15.00
Riders Perpetual Trouble Shooter - 22 vols	\$85.00
Rola Horn Speaker - Works	\$50.00
Rolla Speaker Recreator driver not original	\$60.00
RPC Plastikon Radio 1936 \$	50.00
SECO Tube Tester 107	\$10.00
Sentinel 544 1955	\$45.00
Sentinel 332 1949	\$12.00
Silvertone 6152 1938 - Re-Capped	\$40.00
Silvertone 6220-A	\$15.00
Silvertone Console	\$45.00
Silvertone R1591	\$2.00
Simpson VTVM 311	\$7.50
"Speakers , Horn Qty 2"	\$30.00
Speakers qty 1	\$25.00
Speakers qty 2	\$20.00
Speakers, Round Qty 2	\$190.00
Staco Variac 501 Qty 3	\$30.00

STACO Variacs 1020 - qty 3	\$35.00
Stewart Warner R140-A	\$60.00
Stromberg Carlson 642 1929 - Needs TLC	\$-
Supreme 501 1939	\$35.00
Surface Mount Soldering Station - Complete	\$40.00
TekTronix 315R Scope 1957	\$5.00
Tektronix 564C 1964 Storage Scope	\$25.00
Tektronix Oscilloscope 310	\$25.00
Temple Speaker 1927 Works	\$20.00
Triplett Signal Gen. 3432	\$20.00
Triplett Tube Tester \$	15.00
Tube Caddies, qty 2	\$35.00
Tube Caddy w/ > 100 Tubes	\$20.00
Tube Caddy, Black - Miniature/Octal - NIB	\$40.00
Tube Caddy, red - Miniature/Octal - all NIB"	\$25.00
Tubes & light bulbs - duds but very old	\$20.00
Tubes Loctals qty 28	\$5.00
Tubes Octals qty 53	\$40.00
Tubes one volt qty 40	\$15.00
Tubes two digit qty 34	\$30.00
Volt Ohmest Sr. VTVM - works great	\$5.00
Westinghouse WR-680 1937	\$-
Weston Radio Test Set 565 Type II	\$50.00
Wooden Cathedral Table	\$70.00
Wooden Consoles qty 1	\$35.00
Wooden Tables qty 2	\$7.50
Wooden Tables qty 2	\$30.00
Zenith 1000 Transoceanic - works great	\$45.00
Zenith 10-S-153	\$-
Zenith 10-S-567 1941	\$7.50
Zenith 12-S-370	\$-
Zenith 1949	\$6.00
Zenith 6-B-164	\$35.00
Zenith 6-S-147 Chairside	\$-
Zenith 6-S-254	\$25.00
Zenith 7000-1 - w/ manual & chart	\$150.00
Zenith 7-S-260	\$30.00
Zenith 7-S-363 1938	\$55.00
Zenith 8-S-154	\$120.00
Zenith 9-S-367 - plays	\$-
Zenith 9-S-54 1936	\$55.00
Zenith AM Portable Radio	\$2.00
Zenith AM Radio	\$5.00
Zenith Portable	\$2.00
Zenith Portable AM Radio	\$5.00
Zenith R566 1955	\$10.00
Zenith Royal 7000	\$85.00
Zenith Royal 7000-1	\$55.00
Zenith Transoceanic	\$30.00
Zenith Transoceanic	\$30.00
Zenith Transoceanic	\$25.00
Zenith X-330 1967	\$2.00

# 2009 CRC Auction Photos







# 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)**

**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**

**David Boyle 303-681-3258**  
07/09

## **REPAIR SERVICE:**

Radio repairs for club members.  
Reasonable rates. Good references.

**Call David Boyle**  
**303-681-3258 07/09**

**WANTED:** Old microphones (not CB or ham), working or not.

Also, NBC chimes in good condition.  
**Tom Keeton 303-797-8073**  
09/09

**FOR SALE:** At a most reasonable price: Tektronix o'scope model 7704 (works) with cart, manuals, probes.  
Freq. resp. is 150 mhz

**Call Barney Wooters**  
**303 770-5314 11/09**

Response to

## **"The Italian Connection"**

Note: I let Fabrizio see the article I wrote and he wanted to add his comments.-Rich Kuberski

After many years of distance from the radio world I was happy to meet such a closely knit group of people like those in the CRC at the auction event. I was accepted as a friend and I came out of with new friends and a bunch of stories to tell at home.

That was my first auction and of course I couldn't resist "the temptation" of satisfying a many years old dream. Buying a not working radio is ok, but not having my lab at hand (I am an electronics engineer) was pretty disappointing. And then, in true ham spirit, I got help from nowhere and my transistorized Transoceanic (Royal 7000) is again working (with some limitations I will take care of when I return home).

Thanks to the whole CRC for the hospitality and congratulation for its work. I will try to keep in touch with the club and please feel free to get in touch with me should you plan a visit to Italy. And special thanks to Barney, Rich and Don. They well know why.

Fabrizio, I0QIT

## **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 to Steve Touzalin, either by email at [stevetou@comcast.net](mailto:stevetou@comcast.net), or by postal mail to 417 So. Queen Circle, Lakewood CO 80226.

Formatting is not 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 and we will do our best based on space limitations.

**The November 8th, 1:00 pm meeting will be at the Philip S. Miller Library in Castle Rock**

## Directions

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**

**FIRST CLASS MAIL**