

The

FLASH!

The "Colorado Radio Collectors Antique Radio Club" Newsletter

Dedicated to the preservation and education of wireless, radio, television and associated equipment.

Volume 31, Issue 4

July/August 2020

Arguments against car radios in 1929

by Larry Snyder CRC Co-Editor

The AWA Journal *Old Timer's Bulletin*, Vol.10-2 discusses the radio industry at the time of the 1929 Wall Street Crash, The *Radio Broadcast Magazine*, published from May 1922 to April 1930 was referenced for most of the material. The magazine can be found at www.americanradiohistory.com/Radio_Broadcast_Master_Page_Guide.htm. In Vol.10-2 an article titled *Maine Passes Radio Law* stated, "Harold S. Dockam, radio editor of the *Augusta-Kennebec Journal*, was the author of a radio bill recently passed by the Maine Legislature making it unlawful to operate a radiating receiver." (Editor's note: as different from headphones in use at the time)

Another article in Vol.10-2 titled *Regarding Radios in Automobiles* is copied here for your reading enjoyment.

"Without appearing to judge the case before it is tried, we venture to offer an opinion on this business of radios for automobiles. It seems to us that there are several people to be considered—the automobilist, the innocent bystander already bothered with noise from autos and in danger of being run over by one-arm drivers, and finally the set manufacturer. The automobilist has about all he can do now to stay on the straight and narrow. Are we to have one-ear drivers to add potential sources of accident? And we cannot see how anyone could enjoy much radio music while journeying about in an auto. The rumble of the motor and of other cars' motors would completely mask any low frequencies, even if they could be obtained from the small loud speaker that will be put in the car. The pedestrian or dweller by the road side is already complaining about traffic noise. The din from autos that pass your house, if equipped with radio sets, would be worse than your neighbor's set which may be very loud---it usually is---but is tuned to one program. Instead you would listen to a dozen programs at once going up and down the street.

It is our opinion that the only people who will benefit by the radios for automobiles are those that make---and sell---the sets. The technical difficulties of building a high-quality set for installation within the confines of the average care are almost insurmountable. The loud speaker cannot be very efficient at low frequencies because there is not sufficient space available.

If manufacturers really want a new field to conquer, let them develop cheap portable sets that can be lugged about the house, into the garden, put in the car, taken to the camp, given to the children or merely plugged into a really good loud speaker when a high degree of fidelity is desired.

The magistrates and citizens of New York City are making a determined investigation of the sources of noise in that city. Loud speakers which blat forth day or night in dealers' doorways are coming in for their share of condemnation as being against the public health and comfort. Imagine the task if half the cars that drove along had radios going full tilt to add to the din. There is still plenty for engineering departments to do to perfect present-day radio without turning them loose on a field where radio is neither needed or wanted, and where it is almost certain to become a nuisance."

Have you come across topics club members would find interesting in your reading? The Flash! Editors

Club Announcements

MESSAGE FROM THE PRESIDENT

The Corona virus is impacting all our lives as we try to be safe and avoid unprotected contact with others. Due to fact that most of the club members fit into one or more of the Center for Disease Control (CDC) risk categories the consensus is to forgo the July club meeting, cancel the fall auction & picnic. It is likely the Vintage Voltage show will also be cancelled however not yet confirmed, (Please stay tuned for further guidance).

We are investigating ideas of how we could use electronic media to host a club session or perhaps email to send updates on show and tell / items of interest to the club - more to follow. It is indeed unfortunate that we cannot meet in person however it's just too risky to chance someone getting exposed to the virus. Finally a reminder that club dues are now due so please send in your check to Merril Campbell.

Please stay safe and enjoy the Summer.

Mike Cook

Meeting Locations (Unless noted otherwise)

**Please check website
for latest updates!!!**

Littleton	Castle Rock
January	May
March	July
September	November

CRC MEETINGS

Meetings are held on the 2nd Sunday of every other month starting in January (except May is the 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, participation in our spring show and Fall auction. Current annual dues are \$20. New memberships will be prorated to the following June.

Upcoming Events

July CRC meeting -**canceled**
Aug VV Show -**unlikely**
Sept CRC Auction -**canceled**

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The Origins of Digital Communication

by Paul Heller, CRC Vice-president and member

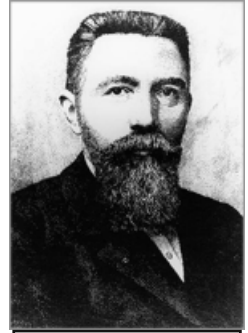
Many of us are old enough to remember early communication from our computer to other computers using something called a dial up modem and speeds of 300 baud. Eventually it was 1200 baud, then 4800, 9600, 19.2k.... 56k! And eventually it was called bps (bits per second) instead of baud.

Where did all this start? Although our story can go back further, let's pick it up from the days of the telegraph. The telegraph can't be discussed without talking about morse code. Morse code was a code of short and long pulses, commonly called dots and dashes, that represented the alphabet. It was transmitted using a variety of methods – flashing lights, electric signals, etc. The most common was the electrical signals. Human beings were able to very quickly learn the code and could send and hear the long and short signals. Humans were able to achieve a very high speed of transmission of these signals.

Various attempts were made to record these signals. One somewhat successful approach recorded them on a moving tape with a pencil that made a mark for each electrical plus. The mark was long or short depending on whether it was a dash or a dot. In-between the marks were spaces. The idea of a mark and a space was soon to be very important.

Morse code had a well defined set of rules about how long a dot was, how long a dash was (three times as long as a dot), how long the pause was between the dots and dashes that make up a letter, between letters, between sentences, etc. To this day these rules are followed by those who transmit using morse code. The problem was that each letter has a variable makeup and variable length. In morse code, the letter E is very short (one dot), a zero is 19 times longer long (five dashes with spacing in-between), with other letters and numbers falling somewhere between these two ranges.

This did not lend itself very well to communication using mechanical machines. So various attempts were made to create a new code. One particular code was invented and patented by a Frenchman named Emile Baudot in the 1870s and gained popularity. It used five “slots” (later called bits) to represent the alphabet and numbers. The slot contained either plus or a minus symbol. The Baudot code, as it was called, had one very important advantage – every letter was the exact same length (five units).



Emile Baudot

Machines were created that enabled skilled operators to send Baudot code to other remote operators. These machines have five keys and the operators had to learn and know the Baudot code and press the right combination of keys



simultaneously to send a letter. It must have been like playing a piano one chord at a time.

(Mathematicians among us recognize this as binary. Five binary digits can represent numbers up to

32, and the Baudot code could represent up to 32 symbols. That's enough for the alphabet and a few extra symbols. More on that later).

In the late 1800s, a man named Donald Murray got the idea to create a mechanical machine that could transmit and print information. He saw that telegrams were transmitted via morse code and then hand typed on a typewriter. His idea was to remove the human and have the typewriter directly type out the message. He envisioned creating the message on a typewriter keyboard and having it type out on another typewriter in another location. Further, Murray's

system stored messages on paper tape with a punched hole representing one state and an unpunched hole representing the other.

He created a modified version of the Baudot code, called the Murray code, that had several improvements.

The Baudot code was designed to minimize wear on the operator's hands.

Murray's code focused on minimizing wear on the machinery. The most common letters in the

English language were assigned the fewest number of holes. Murray also invented control characters such as carriage return and line feed, and shift and unshift characters. Once the machine was shifted (commonly referred to as upper case) the code represented numbers and other special characters until the machine was unshifted. The code was transmitted electrically using pulses. The words mark and space were again used – a mark represented an electrical pulse and a space represented no pulse. As long as the two machines were calibrated to run at the same speed, the length of each mark or space would be the same and information could be transmitted from one machine to another. Today these marks and spaces are referred to as bits, either a marking bit or a spacing bit.

Various techniques were used to synchronize the speed of the machines and also synchronize the transmission of a given letter. The machines were synchronized in one of two ways: either using a governed motor whose speed was set with a tuning fork to an exact value, or a non-governed motor whose speed was set based on the frequency of the AC (60 Hertz in the US).

The synchronization of the transmission is very interesting. We have two machines running the exact same speed. At 60WPM, each bit is 22ms long. So we measure the line for 22ms and decide if the first bit was a mark or a space



Donald Murray

(current flowing or not), measure for another 22ms and decide if the next bit was a mark or space, and so on for five bits. After measuring five timeslices we have a complete character and can decode it. (Note: this is serial communication – one bit after the next).

But how do we begin measuring? How does the receiving machine know when to start measuring the five timeslices being sent by the sending machine? Do you remember configuring your computer with start and stop bits? That goes right back to the mechanical teleprinters! The machines would be connected together and current would be flowing between them. When one machine was ready to send something, it would drop the current for the 22ms. This was called a start bit and was always no current. Then came five data bits, either current or not, then came a stop bit (always current). The stop bit might be very long (until another character was sent), but it was agreed it would always be at least 31ms (so that the two machine could handle slight differences in speed and stay synchronized at the start of each letter). That means the total transmission time for a single character at 60WPM is 163ms. (Note: most of these durations are approximate and by convention. By convention the stop bit is considered 1.42 times the duration of the standard bit. We have a total of 7 bits to represent a character, one start, five data, one stop. If the duration of a bit is one, the duration of the letter is 7.42 bits, so sometimes the Murray code is called a 7.42 code. Later on, Western Union set up some machines with a stop bit twice the duration of a standard bit, and this was the 8.00 code).

Mechanical machines were very successful and were called teleprinters. At the time, speed was measured in words per minute (WPM). Using a globally accepted value (at the time) of six characters per word, WPM can be calculated as approximately 60 WPM from 163ms per character. Baud rate was (and is) determined based on the standard pulse rate. So 22ms = 45.45baud (1/.022).

Teleprinters at the time could reliably transmit at this rate. It seems slow now, but 45baud was really something. Eventually they reached speeds of 100WPM (74baud) in the US and were used in every newsroom in the country. Telex machines in Europe ran at 66WPM (50 baud). There were also other popular teleprinter speeds depending on assumptions of the stop bit length and speed of the motors. For example, Western Union ran a 65WPM service. Sometimes the speed was stated in Baud and sometimes in WPM.



The military used teleprinters extensively in WWII, and this really solidified the technology. The military perfected transmitting without errors and distortion by using one voltage level to represent a mark and different voltage level to represent a space. Relays translated this to the current / no current required by the teleprinters.

The Navy converted the marks and spaces to tones, one frequency for mark and other for space, which could be transmitted via radio waves. It was far more reliable, and used a lot less bandwidth, to have a continuous signal of two frequencies rather than a start and stop of a single frequency, so that is that the Navy did. Something had to convert the currents to tones and convert the tones to currents. This was called a modulator / demodulator, or MODEM (derived from MODulator and DEModulator). Eventually standards were defined as to which frequencies would be used. (Note: The Navy, not having reliable 60 Hertz power on board its ships, used governed motors and turning forks to set the speed of their teleprinters).

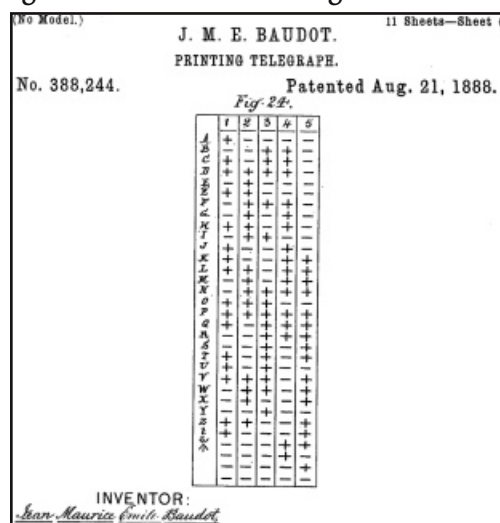
Eventually the Murray code was extended from five bits to seven bits to form new code called ASCII. The extended code could support upper and lower case and many more symbols. This was adopted by personal computers in the 1970s. The term Baud remained for quite a while as a measurement of speed (one baud being one pulse per second).

So there you have it. We have start bits, stop bits and baud rate. The RS-232 standard defined the voltage levels and modems were created to translate those voltage levels to standard frequencies. I remember setting my computer to 1 start bit, 1 or 1.5 stop bits, and 300 baud when connecting to other computing networks in the 1980s.

Eventually phase shifting was employed and one pulse represented more than one bit and Baud no longer made sense. Things were switched to bits

per second. And the need to set start and stop bits disappeared as well. My home ethernet network runs at 1Gbps speed, or 22 million times faster than the teleprinters that transmitted major news events such as the killing of John F. Kennedy or the landing of men on the moon.

Want to hear a 45.45 baud 5 bit Murray code signal complete with start and stop bits? Go to <http://internet-tty.net:8000/TTY>.



You will hear two tones, 2125Hz for mark and 2295Hz for space. If you hear a steady tone when you happen to listen, that is the mark tone (the stop bit). It stays in the stopped state while the source is preparing to send out a new transmission. What a few seconds and it will start transmitting.

Go grab a modem and a teleprinter and you can print out the signal!

Source for photos: <https://en.wikipedia.org/wiki/>

We were saddened to learn that CRC member John Hof passed away on May 26th. John lived in Fort Collins. Our sincere sympathy goes out to John's family.

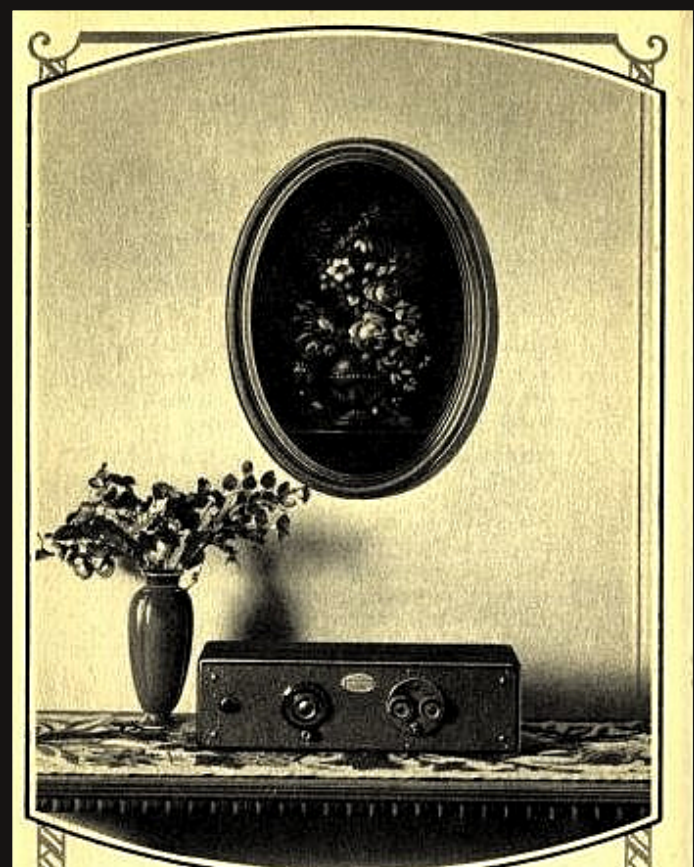
Just a Reminder:

Club dues were due in June. Dues still are only \$20 for a full year. If you have not yet renewed your membership, please make your checks payable to:

Merril Campbell and mail

your payment to:

Merril Campbell
4723 Woodbury Dr.
Colorado Springs, CO 80915



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☐ I enclose \$2.98 plus 35¢ shipping charge.

☐ Send C.O.D. I will pay postman on delivery plus C.O.D. and shipping charges.

Name _____
 Address _____

The **Bald Letter** is the work of Dick Karman who is a member of NW Vintage Radio Society, who we do exchange club newsletters with. We have sent out copies of his newsletter on the egroup email, but in case some of you did not receive them his web site address is listed below. They are very refreshing and interesting reading.

<http://relivingradio.com/>

Just follow the link on the web site.



REPAIR SERVICE: Radio repairs for club members. Reasonable rates. Good references.

Call David Boyle 303-681-3258

FOR SALE:

1) Knight (Allied Radio) Model KG-680 In-Circuit Capacitor Tester

Note: This is a unique in-circuit capacitor tester for opens and short indications. Not the usual test bench capacitor tester for capacity and other electrical characteristics. Eye tube is very bright. Completely electronically refurbished with required new parts and one new tube, other tubes good. Tested and ready to use with instructions. New test leads. Complete manual available "free" on the Internet. \$60.00

2) EMCO Model 20DT Dual Trace Oscilloscope.

Works fine, just retired from my own radio/TV repair and test bench! With both probes. Ready to use. \$80.00

Call David Boyle, 303-681-3258

djboylesr@msn.com

FOR SALE: Radio Tubes. Tested as "Very good" to "good." Tested on some of the top end and calibrated Hickok testers. Have around 3000 plus tubes tested and boxed ready to go. Inventory includes many new tubes. Prices on used tubes typically would be 50% or less of AES posted prices. Cost of all new or used tubes can be negotiated. ALSO FOR SALE: Large selection of NOS Dial Belts from recent sources. GC and JFD Brands. All I need is brand and model number...I have catalog data to look up the correct belt. If I have it...\$4.00 each. David Boyle 303-681-3258 or better yet:

djboylesr@msn.com

FOR SALE:

Tube Radios - Tombstone, Cathedral and Novelty Transistor Radios.

I have collected radios of all types for 35 plus years and now it is time to let them go to new home/s. I have over 250 tube type and over 5,000 transistor (both novelty and shirt pocket type)

Please call 303-2381384

radios4us@aol.com

Thank You,
Ron Smith

WANTED: Emerson "Mae West" radio.


Call Gary Stone 720-771-2080,

redson68@hotmail.com

Thanks!

WANTED: I am searching for a vintage Sony PS-F9 Vertical Record Player sometimes referred to as a Sony Flamingo Record Player. Please contact Jonathan Brown at jbrown220@aol.com or call 303-514-9900 Thank you.





Quickie Q-Tips

Have you removed a resistor or capacitor from a chassis and forgot where the replacement goes?

Before removal place an alligator test lead across the points where the new part will be soldered in.

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, OpenOffice, RTF, or as plain text**. Submit to Steve Touzalin by email at: stvetou@comcast.net or Larry Snyder at lsnyder200@cs.com 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.

CRC Meeting July 12th - canceled!



The Denver Post - 1929

**Check the CRC web site
and the egroup emails
for club activity updates!**

**Reminder:
Dues were
due in June.**

**Colorado Radio Collectors
Antique Radio Club
417 So. Queen Circle
Lakeewood, CO 80226**

