



The Hellgate Static

February 2023



Hellgate Amateur Radio Club

P.O. Box 3811, Missoula, MT 59806-3811

Web: www.w7px.org

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Officers:

President: Eric Sedgwick, NZ7S
Vice-President: David Herzberg, K7MTD
Treasurer: Dick Walton W7XT
Secretary: Mike Leary, K7MSO

Standing Committees:

Emergency Coordinator: Mike Leary, K7MSO

QSLs, Awards: Mike Leary, K7MSO

Webmaster: Mike Leary, K7MSO

Asst Webmaster: Paul Shuey N7PAS

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Paul Shuey, N7PAS

Static Editor: Paul N7PAS

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Advisory Committee's:

David Herzberg, K7MTD (Chair)

HF-D Tom Hellem, K0SN Dec 2021 for (22/23)

HF-V Tom Mc Ginley, K7QA Dec 2022 for (23/24)

V/U-D Paul Shuey, N7PAS Dec 2022 for (23-1Yr)

V/U-V Gary Duncan, KG7WYQ Dec 2022 for (23/24)

Coming Events

Feb 13 Testing, Meeting
Feb 14 Valentine's Day
Feb 20 Presidents' Day
Mar 13 Testing, Meeting
Mar 17 St. Patrick's Day

HARC February Meeting

Program: ???
by ???.

We are having in-person monthly meetings and live in person online testing. The testing and meeting are on the 2nd Monday of each Month

Meetings will be held at The Church of Jesus Christ of Latter Day Saints, 3026 South Avenue West, across the street from Big Sky High School. Use the North entrance as all others will be locked.

Testing will begin promptly at 5:30PM, and end at 6:30PM.

Meeting area will be set up between 6:30-7:00PM and meeting will begin at 7:00PM (Business & Program).

Cleanup will be done from the end of the program until done. Volunteers may assist.

Our good friend Terry Cook is still having medical problems. Please keep him in your prayers. Terry is still having swelling problems with his arms and legs. Dr thinks it might be nerves. Terry is at home. Give him a call on his mobile 406-396-0475. Stop by and say hi, but give him a call first.

January Meeting Testing Results

Congratulations to:

1. Tyler Arlint who passed his Tech. His new call sign is KK7JYK
2. David Kelley who passed his Tech. His new call sign is KK7JXZ
3. John Christiansen who passed his Tech and Gen. His new call sign is KF0LFX.
4. Niles Leuthold who passed his Tech and Gen. His new call sign is KK7JYA

HARC Meeting 9 January 2023 Minutes

1. Attendance:

Eric NZ7S, Paul N7PAS, Mike K7MSO, Gary KG7WYQ, David K7MTD, Dale W7RPG, Aaron N7BIO, Bill KJ7PCR, Rich KN7QNE

2. Approval of December meetings minutes - Approved

3. Treasurer's report - Tabled due to Treasurer's absence

4. Repeater committee report

Tom K7QA and Gary KG7WYQ reelected for two more years

Paul N7PAS volunteered for one year to replace David K7MTD.

5. Update of the Finance committee membership

Club Officers + 'Ex Official Board Members Tom K0SN + Paul N7PAS

6. Constitution and By-Laws Revision Committee - Club Officers + Dale W7RPG + Paul N7PAS

7. Net Control Operator

1 Paul N7PAS 8 Mike K7SMO 15 Dale W7RPG 22 Jerri N7JGS

8. David K7MTD made a motion to add a Buy/Sell/Trade to the Saturday morning net.

Discussion was that Amateur Radio Equipment only could be allowed.

Motion approved

9. Membership has not seen a list of club inventory which has been promised in several past meetings. It can be put in the static.

10. K7MSO will look into setting up a web/email service for the club board

11. Meeting adjourned.

12. David K7MTD gave a great presentation on tracking / reclaiming weather balloons.

Balloon hardware that he has recovered were displayed at the meeting.

Secretary: Mike Leary K7MSO

PBS Production of Ham - Hams in Montana

Aired date November 24, 2022 7:30 PM Mountain time

<https://www.montanapbs.org/programs/ham/>

This program is 25:42 minutes long. **It is well worth watching.**

It was put together by university students here in Missoula, MT.

DUES REMINDER:

Dues for 2023 are due in January. They are now overdue.

The current amount is \$25.00 per person and \$5.00 for each additional family member.

1 year free members, your payment will be due the month you earned your license and will be prorated to the end of 2023.

Dues may be sent to Hellgate Amateur Radio Club, P.O. Box 3811, Missoula, MT 59806-3811

Please send your payment in now to keep from being dropped from the newsletter.

Volunteers on the Air VOTA

Here is a video by our very own Northwest Division Director, Mike Ritz

W7V0. In this video, Mike will explain all the details of this exciting year long event.

<https://www.google.com/url?q=https://youtu.be/J2jq3yolL8E&sa=D&source=editors&ust=1673821861877018&usg=A0vVaw1EgnVH0M74hFNZv2pT9gXN>

I hope all of you take part in this exciting ARRL event.

ARRL Montana Section

Section Manager: Paul Edward Stiles, KF7SOJ

kf7soj@arrl.org

WX Balloon info

I have received a request for some follow-up information after my Chasing Weather Balloon presentation at the last HARC meeting.

For tracking WX balloons, the most popular site is sondehub.org. Another is radiosondy.info but it does not have as large a following as Sondehub.org. The good news is that I upload my data to both sites so you can see some activity from both Spokane and Great Falls launches fairly regularly.

As an aside, you can monitor amateur hot air balloon flights at amateur.sondehub.org.

The following is the hardware I use:

1. Raspberry Pi 3 - these are in short supply and therefore prices are high. The operating system I use on it is Linux. You may be able to find another flavor of Raspberry Pi like devices out there, as long as they can run Linux.
2. RTL_SDR dongle - The ones I use are made by RTL-SDR.com and make sure it is at least a V3. Only one is required but I use two so I can receive two stations simultaneously.
3. Antenna: The receivers run on 400-406 Mhz. A 70cm antenna or rubber duck would work but have some fun building your own ¼ ground plane antenna and put it outside.
4. Optional: I use an in-line 403Mhz signal pre-amp which gives me 21db gain and with that, I have a pretty large receive area footprint.
5. Software(Firmware): I use Radiosondy_Auto_RX found at https://github.com/projecthorus/radiosonde_auto_rx
Scroll down a bit on the page and you will find links to step by step instructions on how to install and configure.
6. Another good resource is the Radiosonde North America NWS Weather Balloon group on Facebook. It is pretty active and lots of new people and old sharing their chasing fun and equipment building information.

This has been a fun activity, although not many landing in our area. I enjoy just watching the twice daily launches.

If you have any questions, please email me at K7MTD at [ARRL.net](mailto:K7MTD@ARRL.net)

Dave K7MTD

Charles Steinmetz,

The Father of Electrical Engineering

By [Vaughn D. Martin](#)

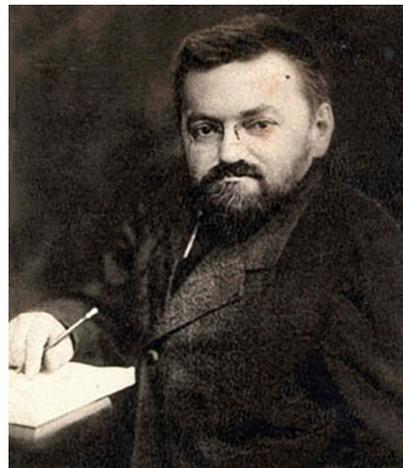
Historians often miss inventor's most important inventions — and even miss great inventors altogether! This was never truer than with Charles Steinmetz. But Eli Whitney and Fibonacci definitely prove my point about historians.

Ask any school child what Whitney's most notable invention was and they will say the cotton gin when, in fact, he was the father of interchangeable parts — the basis of all modern manufacturing. During the Revolutionary War, the government required a large number of muskets. Hand-fitting and filing each piece in the firing mechanism and trigger would have been a daunting task. Therefore, necessity was the mother of invention and Whitney came up with the new idea of identical, totally interchangeable parts.

Fibonacci invented the mathematical series, for which most know him, but he was the son of a diplomat to Baghdad — a center of learning at the time. He brought Arabic numerals back to early Europe, which the world universally uses today. Previously, Europe used awkward and cumbersome Roman numerals. Very few people know this or credit him with that, just like Whitney's monumentally important interchangeable parts concept.

The Father of Electrical Engineering

Steinmetz was born Carl August Rudolph Steinmetz in Breslau, Prussia on April 9, 1865. Steinmetz was a hunchback dwarf only four foot three who also suffered hip dysphasia. These hereditary problems perpetuated themselves through three generations of males in his family. This prompted Steinmetz to never marry and have his own children. However, this did not stymie his great humanistic tendencies and intellectual curiosity that impacted the world. Steinmetz later changed his middle name to Proteus, the Greek god who could assume any shape or size, for obvious reasons considering his condition.



A Similarity with Einstein

When he was eight, Steinmetz had great trouble with multiplication tables. However, within two years, he was one of the school's best students and excelled at math. Incidentally, Einstein was very poor at math early on, only to likewise do a complete turnaround in math and science. Steinmetz attended Wroclaw University, working on his undergraduate degree in 1883. He almost completed his Doctorate by 1888 when German police began investigating him due to his strong outspoken Socialist beliefs.

A Fortuitous Incident

This, along with several influential newspaper articles that he wrote on this subject, forced him to flee to Zürich in 1888. Soon this same behavior pattern prompted him to leave Zürich and to emigrate to America. Steinmetz was almost turned away at Ellis Island. This was because he was a dwarf, and immigration officers considered Steinmetz medically unfit and asked what profession he had to which he answered “theoretical physicist” to the astonished bewildered official. Then, he presented some of his drawings and said “draftsman,” satisfying the official.

A Real Self-Starter

Steinmetz quickly went to work for Rudolf Eickemeyer in Yonkers, NY in a firm making transformers. Almost simultaneously the newly formed General Electric Company tried to hire him. But he remained loyal and grateful to his first employer, until 1893 when GE bought Eickemeyer’s company, along with all of the patents and designs. That same year, Steinmetz made one of the greatest contributions to the field of electrical engineering. He gave a lecture describing the mathematics of the alternating current phenomena. Previously, this was more of an art than a science by those who called themselves electrical engineers. This breakthrough allowed engineers to design electric motors by mathematics rather than by empirical observations and mere trial and error.

This clear presentation of previously muddled, poorly defined and explained mathematical concepts finally simplified AC where all engineers could both understand and use it. It was Steinmetz who first explained impedances by using complex and imaginary numbers, and this is why many call Steinmetz the Father of Electrical Engineering. This work opened the way to the transmission of electric power in useful quantities over long distances.

Solving AC Motor Internal Heat Build-Up

In the same year, Steinmetz’s experiments and papers on magnetic hysteresis (the tendency of a material to resist being magnetized or demagnetized) came to the attention of General Electric. This had a profound implication for its day. It reduced the internal heat build-up in electric motors that had previously greatly shortened their useful lives.

This solution of internal AC motor overheating was somewhat of an accident, like many scientific discoveries tend to be. When Mr. Otis of Otis elevator fame needed a more powerful motor to reach higher floors, Steinmetz designed the motor. With each success, Steinmetz’s fame spread. An example was the nephew of Cyrus Field of Atlantic Cable Car Company approaching Steinmetz’s employer Eickenmeyer. He wanted to propel trolley cars by AC.

The problem was that during the transition from DC to AC, the delay overheated motors due to phase problems. Steinmetz mathematically solved this. His solution became the “Law of Hysteresis” also later known as “Steinmetz’s Law.” Steinmetz explained this Law of Hysteresis in 1891 within The Electrical Engineer magazine. In early 1892, he presented this explanation again in a speech to the American Institute of Electrical Engineers in New York City. By now, GE wanted to hire Steinmetz even more and the only way was to buy Eickenmeyer’s company — much like Bill Gates did with rival companies last decade and continues to do to a lesser extent today.

Buying a Company Just to Get an Employee

In 1894, General Electric moved to Schenectady, NY, and Steinmetz, who was assimilated in the acquisition, was now the head of GE's "calculating department." There, he solved mathematical problems that were impediments on projects of his fellow engineers. In his free time, Steinmetz worked on experiments in electrical engineering.

An Unsuspecting Hero

Steinmetz's indefatigable energy and sheer genius not surprisingly made him a priceless GE asset, allowing him to quickly progress up the corporate ladder. He was not at all a self-serving sort, quite the opposite. But newspapers and the public still became enamored with Schenectady's scientific wizard. Newspaper and magazine reporters clamored for interviews and photographs of Steinmetz, especially at work. In 1916, he built a lightning generator whose power approached the estimated energy of a real lightning discharge. Newspapers called it the "Modern Jove" and "The Thunderer."

The advertisement department at GE rode the Steinmetz bandwagon by allowing it to promote electrical home appliances. Steinmetz's lightning generator mesmerized his generation and helped foster the universal electrification of America.

Steinmetz did not disappoint his faithful following or GE. Before 1900, Steinmetz had applied for over 70 patents on transformers, induction motors, alternators, and rotary converters. By 1900, as GE's chief consulting engineer, he devoted himself to his research. By 1913, he had 63 patents granted and wrote several textbooks. His classic publication that cemented his claim as the Father of Electrical Engineering was *Theory and Calculation of Transient Phenomena and Oscillations* (1909). It clearly and definitively explained surges in AC circuits and machines. Steinmetz later commented that this was one of his three greatest technical achievements. The others were his groundbreaking research on magnetic hysteresis and the development of the complex number method.

Steinmetz, the Shunned Humanist

Steinmetz's contorted, hunchbacked, shriveled torso and enlarged head in proportion to his body always frightened children. Nonetheless, he had a special fascination and fondness for them and their education.

When called to serve on the school board, Steinmetz became an accidental political activist. But like everything else dealt him in his life, he made the best of it. He was instrumental in building more schools to eliminate some students attending school for only half days. He encouraged the hiring of seven nurses and seven part-time doctors, and set aside special rooms for feeding undernourished students. He began the concept of un-graded classes for immigrant children with language problems to lessen the stigma of failing or having to repeat a grade. He also worked to set aside classrooms for learning disabled pupils, and saw that all primary grade textbooks were free.

Steinmetz was Jewish but paid for a present for every Schenectady orphan at Christmas. During his two school board terms, Steinmetz fulfilled the Socialist administration's promise to provide "One Seat for Every Child" by passing \$800,000 in bond issues. This helped build three new schools and enlarged three others. It also helped with free school supplies, more playgrounds, and improved medical care for students. Above all, Steinmetz was a practical man. By 1922, he concluded that America was not right for Socialism since we lacked a "powerful, centralized government of competent men, remaining continuously in office" and because of so few Americans espousing this philosophy.

Outclassed by an Intellectual

Heavyweight Thomas Edison attributed his success to “one percent inspiration and 99 percent perspiration.” But Edison was largely a self-taught individual and it showed when he intellectually challenged Tesla, and especially Steinmetz. Edison argued with Steinmetz that cities should adopt power distribution systems based on DC instead of AC, but any schoolboy knows from Ohm’s Law that current encountering resistance causes a voltage drop. Stringing long wires to electrify cities by DC is a classic example where huge IR drops would have occurred.

A Visionary — Way Ahead of His Time

Steinmetz was a strong advocate of electric vehicles. He was ill-advised though to allow investors to form the Steinmetz Electric Motor Car Co. in 1920. Their intent was to produce 1,000 “industrial trucks” and 300 lightweight “delivery cars.” In early 1922, the company unveiled its first electrical Steinmetz truck and it proved itself in a publicity stunt by climbing a steep Brooklyn hill. In October, the company claimed a five-passenger coupe, but a stockholder discovered falsified production records and then both litigation and corporate collapse soon followed. Steinmetz’s predictions included central air conditioning, television, central power stations, and what really fascinated him was the free powerful clean source of energy from our sun. Fortunately, he did live long enough to witness the electrification of industry and widespread use of both radios and electrical home appliances.

Steinmetz, the Real Character

Steinmetz was a very kind man and once when working in his lab, a person entered and commented on how cold it was and asked why there was no fire in the stove. He replied that he had noticed that a family of mice had decided to make that their home. Steinmetz’s Schenectady home also resembled a zoo with a nest of owls, several alligators, a raccoon, two black crows, a monkey named Jenny, and a temperamental Gila monster. Neighbors also brought him animals that needed to be nursed back to health.

Scorn also knew no retribution in Steinmetz’s mind. He developed a close paternal relationship with his lab assistant. But despite one day accidentally overhearing his assistant’s wife describe him as being physical repugnant, he allowed them to move in with him and even adopted their son as his own. He also built this woman a greenhouse since she greatly fancied flowers. He also populated it with cacti from all over the world and would sit for hours there staring off into space. It was where he said he thought best.

The Ever Present Sense of Humor

After retiring from GE, he taught electrical engineering at that city’s Union College starting in 1902. But GE still frequently used him as a consultant. Despite the most concerted efforts by GE technicians, one very complex system’s problem stubbornly defied solving. Steinmetz laboriously traced the problem to a faulty part and marked it with a piece of chalk. Steinmetz submitted a bill for a whopping \$10,000. The appalled and shocked GE managers required an itemized invoice for such a huge bill. So Steinmetz sent back his itemized bill with \$1 for marking the chalk spot and \$9,999 for knowing exactly where to place that mark. Steinmetz also formed a club, “The Society for the Adjustment of Salaries.” Members played draw poker most of the evening. He also liked to remind engineers that his initials CPS also stood for cycles per second — emblematic of AC — which was his best understood and explained subject.

The Teaching Method Left as a Legacy

Near the end of 1902, Steinmetz became the part-time head of the Electrical Engineering Department at Union. He happily held this position for 10 years, serving without pay. He had the best of both worlds by combining teaching each morning with laboratory work for GE each afternoon at his home.

Steinmetz was ever the humanist, believing that receiving only technical training is not real education at all. Steinmetz always began with simple concepts and evolved on a step-by-step basis toward more difficult and involved ideas. But he failed to realize why all of his students did not immediately understand just how logical his step-by-step approach was.

Nonetheless, he offset this with great patience and the student always came first. He answered student's questions on their breaks, after class, or even at his home. This made him so popular with students that they made him a Phi Gamma Delta fraternity brother.

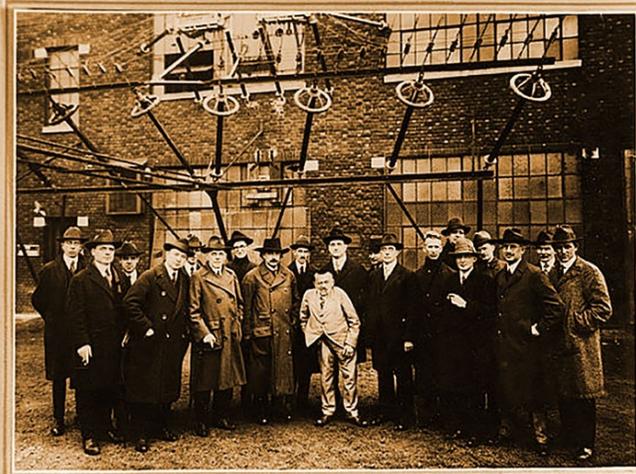
An Early Death

Steinmetz died of heart failure on Oct. 26, 1923. By that time, he had amassed over 200 patents. When he died, Henry Ford bought the camp where Steinmetz spent his summers frolicking with friends and especially children. He moved it to The Dearborn Institute in Michigan.

President Herbert Hoover raised \$25,000 to purchase Steinmetz's home and convert it into a museum but after securing the money, the city and state disagreed on who should restore it, so they sadly leveled it 15 years later. New York Governor Alfred E. Smith said, "He always wanted to help everybody." In 1983, the United States Post Office issued a commemorative stamp in his honor. **NV**



I have succeeded
in getting my actual
work down to 30
minutes a day. That
leaves me 18 hours
for engineering.



Albert Einstein, conductor on inspection tour
of ACB, November 1921, at Westborough, MA

1921

Among the guests are
Albert Einstein, Steinmetz, Compton
and other famous scientists.

HELLGATE AMATEUR RADIO CLUB

AGENDA – 13 Feb 2023 meeting

Introductions. Please make sure you sign the attendance sheet

Last meeting minutes: Motion to approve minutes: 1st _____ 2nd _____
Discussion _____ Vote: P/F/T _____

Treasurer's report: _____
Motion to approve report: 1St _____ 2nd _____ Discussion _____ Vote: P/F/T _____

Repeater Advisory Committee Report: _____

Motion to approve report: 1St _____ 2nd _____ Discussion _____ Vote: P/F/T _____

Events for 2023:

- 13 Feb – Testing and Meeting
- 14 Feb – Valentine's Day
- 20 Feb – Testing and Meeting
- — — _____

HARC Social Net every Saturday morning @ 9:00 AM on 147.040 Repeater – Buy/Sell at end.

HARC Discussion List

1. _____
2. _____

VHF Net Control Station assignments:

Feb 1 _N7PAS_ Backup	Mar 1 _N7PAS_ _____
Feb 8 _K7MSO_ Backup	Mar 8 _____
Feb 15 _N7JGS_ Backup	Mar 15 _____
Feb 22 _W7RPG_ Backup	Mar 22 _____
---- -- _____ Backup	Mar 29 _____

Reminder: Backup is always the next person in line as the net control.

Good and Welfare. _____

***** Next Club meeting: Mar 13**

Motion to Adjourn: 1st _____ 2nd _____ Vote: P/F/T _____

Program: **None,**

If anyone wants to volunteer please show up prepared and let Eric know

February

2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28	30	31	1	2	3	4
			ERC NET 7:30 On 146.900-88.5T BARC NET 8:15 On 146.720-203.5T HARC NET 9:00 On 147.040+No Tone			HARC Sat Net 9:00Am on 147.04 Repeater
5	6	7	8	9	10	11
			ERC NET 7:30 On 146.900-88.5T BARC NET 8:15 On 146.720-203.5T HARC NET 9:00 On 147.040+No Tone			HARC Sat Net 9:00Am on 147.04 Repeater
12	13	14	15	16	17	18
	HARC Testing 5:30 & Meeting 7:00 PM	Valentine's Day	ERC NET 7:30 On 146.900-88.5T BARC NET 8:15 On 146.720-203.5T HARC NET 9:00 On 147.040+No Tone			HARC Sat Net 9:00Am on 147.04 Repeater
19	20	21	22	23	24	25
	Presidents' Day		ERC NET 7:30 On 146.900-88.5T BARC NET 8:15 On 146.720-203.5T HARC NET 9:00 On 147.040+No Tone			HARC Sat Net 9:00Am on 147.04 Repeater
26	27	28	1	2	3	4