

News Beacon

Medina County Amateur Radio Club

Prez's Preface

"We are not makers of history. We are made by history."

"Martin Luther King, Jr.

The history of Amateur Radio in Medina County goes back **90 years** to 1932 with the inception of the Medina County Radio Club, Medina Old Timers' Radio Club around 1971, Medina County Amateur Radio Club around 1974, and our current Medina Two Meter Group, Inc (M2M)- AKA Medina County Amateur Radio Club in 1975.

Les Lesnick W8BID (SK) and his daughter Tamara WA8KGV were so kind in donating a trove of documents, news clippings and pictures of the early days. Dave Swancer KE8APO, his lovely wife Bernadette and I started assembling a chronological scrapbook for our Club Archives. I hope to spend more time perusing our history to glean an article or two for the local newspapers.

I will bring the still-in-progress scrapbook to our August General Meeting.

Enjoy the sweet remnants of Summer.

73, Jane@K8JGR.radio

Skywarn Net Control Opportunity



Skywarn Coordinator, Tracey W8TWL, is looking for Hams who would like to serve Medina County as NCO when the Skywarn Net is activated.

According to the Cleveland Office of the National Weather Service website, "The Weather Office and/or emergency management authorities may activate the SkywarnTM net usually whenever there is a threat severe weather or the forecast office issues a severe thunderstorm watch, tornado watch, or flood watch. In this case, information will be relayed through our amateur radio repeater....Ham radio operators have a special place in the Cleveland SkywarnTM system ... A Skywarn Net run by the volunteer amateur radio net control operators allow for reports from the field to be directly heard at the Weather Service."

If you are interested in training for becoming a local Skywarn NCO, please contact Tracey at twltwl2@yahoo.com



Inside this issue

6M Repeater TX Tower.....	2
July 11th Minutes.....	3
Calendar	4
August 8 Meeting	5
Special Event W8B.....	6
Flying Clocks.....	7-9
Repeaters &Nets.....	10
Who We Are.....	11
What We Do.....	12



Hmmmmmm...

"I am often asked how radio works. Well, you see, wire telegraphy is like a very long cat. You yank his tail in New York and he meows in Los Angeles. Do you understand this? Now, radio is exactly the same, except that there is no cat."

Unknown author

Six Meter Repeater Tower Installation

July 27, 2022 saw the installation of the 6M repeater transmitter at the back of Kevin Reed's building, ThunderEcho Commons, in Brunswick Hills. The crew consisted of Fred K8FH, Ken K8TV, Ed K8NVR, John K8JEK, Jane K8JGR and Kevin.



Photo courtesy of John Kollar K8JEK



Above photos by Fred K8FH and Jane K8JGR

July 11th In-Person General Meeting Minutes

The July 11, 2022 Member Meeting was held in-person at the Senior Center.

The meeting was called to order by President, Jane K8JGR, and the Pledge of Allegiance was recited at 7:31 pm . The following (16) paid members were present so quorum (9) was reached.

Dave NK0K	Gordon A18Y	Ed K8NVR	Tracey W8TWL
Diane KD8SSX	Bob K8MD	Toby WT8O	Tamara WA8KGV
Doug KD8SST	Jane K8JGR	Amy K2KSU	Aidan Haggard
Dave KE8APO	John K8JEK	Baji K8IIT	
Gail KD8GGM	Fred K8FH	Troy KD8UJG	

Secretary's report: Motion to accept the minutes of the June 13, 2022 meeting as published in the July News Beacon was made by Gail KD8GGM and seconded by Bob K8MD. Minutes were accepted with no corrections or changes.

Treasurer's report for June was read by Toby WT8O. Motion to approve: Diane KD8SSX; Second: Tracey W8TWL, approved.

President's report: Jane K8JGR stated that we are still looking at different meeting venues. She contacted Nathan at Medina Parks regarding the Loveland Farm House, but it is under-going renovations and will not be available for a few years. Buehler's River Styx is a possibility and the library is a possibility again since Aidan shared that they have meeting rooms available with external access for after hours. * John Bostwick AC8E-SK's equipment is available for sale as listed in the July newsletter. * The NOARS Hamfest is July 16th. * Be were aware of a Chinese scam regarding website domain names supposedly needing to be updated and money sent. * Additionally there is a change in the W8EOC.org website for newsletter requests. * An email to Jane is all that is needed new rather than a form being filled out. * Brunswick Heritage Farm Market is every Sunday 10 am to 1 pm. Fred will select a date to bring the trailer for a display and advise club. * Other events: There are some future local marathons scheduled (i.e. Tunnels to Towers) but the communications team is handling support on these. * Skywarn: Tracey stated that we can use more net controllers as well as observers. Observers need to understand reporting criteria. Tracey will write something up for the future newsletter.

Programs: Toby WT8O is looking for ideas and presenters for future technical programs. One possibility is a presentation on FT8. Jane asked if the members might be interested in non-Ham presentations. Dave KE8APO offered to give a presentation on weather radar at a future date.

Repeaters: Ed K8NVR reported that the new 220 repeater has been returned from repair and is currently being burned in. South tower painting is scheduled for August at a cost of \$4000, In return, the club needs an agreement from the owner to allow repeater/antenna access for 15 years. The 6m transmitter is being set up at Thunder Echo Commons.

Nets: Baji K8IIT is still needing net controllers for our weekly nets. If every member would consider doing one or two nets a year, it would easily fill the schedule. Please consider doing net control and contact Baji to be put on the schedule.

Field Day: Fred K8FH submitted field day results for the newsletter and he and Amy K2KSU supplied pictures. There was a nice article on Field Day in the Gazette. Unfortunately it was on a day that it was only available online.

Comments: Bob K8MD stated that there will be a special event honoring the 80th anniversary of Bird Technologies. Go to Birdrf.com for details, frequencies, and times. * Toby WT8O stated that the Twin Sizzler went well and no one was hurt. There were some last minute course changes, but Rene KD8SSW and team handled everything well.

Motion to Adjourn: Made by Gail KD8GGM and seconded by Amy K2KSU. The meeting was adjourned at 8:15pm.

Technical Session: Following the meeting Dave KE8APO demonstrated the TinySA spectrum analyzer.

Respectfully submitted by Dave KE8APO



Club Meetings

The Medina County Amateur Radio Club will be cautiously holding in-person meetings on the second Monday of each month while the threat of Coronavirus is under control.

In April the MCARC General Meeting will be held at the Senior Center at 7:30pm. Please arrive early since doors will be locked by 7:30pm.

Medina County Senior Center (Basement) aka: Medina County Office for Older Adults 246 Northland Drive Medina 44256.

Member Birthdays

Stephen Kinford N8WB 08/17

Anthony Crespo KC8PTQ 08/31

MCARC Calendar

August	1	7:30pm Monday Night 2M Net
August	8	7:30pm IN-PERSON MEETING
August	15	7:30pm Monday Night 2M Net
August	22	7:30pm Monday Night 2M Net
August	29	7:30pm Monday Night 2M Net

ARRL Ohio Hamfests

08/06/2022 - Columbus Hamfest

Location: Grove City, OH

Sponsor: Aladdin Shrine Audio Unit

Website: <http://columbushamfest.com>

08/13/2022 - Cincinnati HamfestSM

Location: Owensville, OH

Sponsor: Milford ARC

Website: <https://CincinnatiHamfest.org>

08/21/2022 - Warren ARA Tailgate Swap Meet

Location: Cortland, OH

Sponsor: Warren ARA

Website: <http://facebook.com/w8vtd> website: <http://W8FY.ORG>

August ARRL Contests

6-7	222 MHz and Up Distance Contest
20-21	10 GHz & Up – Round 1
21	Rookie Roundup – RTTY

Saturday 8am Breakfast

Join the members who are early risers at the Cracked Egg Restaurant at 1475 Pearl Rd in Brunswick, opposite the Middle school, Saturdays at 8am.





Hamatuer Antix



"Hang on a minute Larry...my SWR is jumping...I'm going outside and see what the problem is..."

MCARC will be holding Technical Sessions during most of our in-person General Meetings on the 2nd Monday of each month. Since we are in need of a Program Chair, PLEASE CONSIDER VOLUNTEERING FOR THIS POSITION. Our Club is only as terrific as YOU make it!



August 8 IN-PERSON General Meeting

Come join us at our August 8 General Meeting at the Medina County Senior Center, 7:30pm. Doors are locked at 7:30pm, so please come early. See page 4 for address.

The evening's Technical Session will be presented by Dave KE8APO, who will cover the history, theory, and limitations of both aircraft and National Weather Service radar.

Sounds really interesting! Come and join us.

Bird Technologies Special Event Station W8B

Bird's 80th Anniversary Special Event Station W8B was held July 16, 2022 at headquarters in Solon hosted by Bob K8MD, Fred K8TV, Dave NF8O and Ken K8TV.

Bird is recognized in the Amateur community and commercially as the expert in RF communications, measurement and management providing innovative RF products, systems, services and educational solutions to the wireless industry.



Photos courtesy of Fred K8FH

Einstein Was Right. Flying Clocks Around the World in Opposite Directions Proved It

Time isn't the same for everyone, even on Earth. Flying around the world gave Einstein the ultimate test. No one is immune from relativity. **Key Takeaways:** According to Einstein's relativity, if you move relative to another observer and come back to their starting point, you'll age less than whatever remains stationary. Einstein also tells us that the curvature of space itself, depending on the strength of gravitation at your location, also affects how fast or slow your clock runs. By flying planes both with and against Earth's rotation, and returning them all to the same starting point, we tested Einstein as never before.

Here's what we learned... In 1905, our conception of the Universe changed forever when Einstein put forth his special theory of relativity. Prior to Einstein, scientists were able to describe every "point" in the Universe with the use of just four coordinates: three spatial positions for each of the three dimensions, plus a time to indicate which moment any particular event occurred. All of this changed when Einstein had the fundamental realization that every single observer in the Universe, dependent on their motion and location, each had a unique perspective on where and when every event in the Universe would have occurred.

Whenever one observer moves through the Universe relative to another, the observer-in-motion will experience time dilation: where their clocks run slower relative to the observer-at-rest. Based on this, Einstein suggested that we could make use of two clocks to put this to the test: one at the equator, which speeds around the Earth at approximately 1670 km/hr (1038 mph), and one at the Earth's poles, which is at rest as the Earth rotates about its axis.

In this regard, however, Einstein was wrong: both clocks run at exactly the same rate relative to one another. It wasn't until 1971 that a proper test could be conducted, and it required a lot more than special relativity to make it so.

Back when Einstein first put forth his special theory of relativity, there was a missing element: it didn't incorporate gravitation into the mix. He had no idea that proximity to a large gravitational mass could alter the passage of time as well. Owing to the planet's rotation and the attractive gravitational force of every particle that makes up the Earth, our planet bulges at the equator and gets compressed at the poles. As a result, the Earth's gravitational pull at the poles is slightly stronger — by about 0.4% — than it is at the equator.

As it turns out, the amount of time dilation due to a point on the equator zipping around the Earth is exactly cancelled by the additional amount of gravitational time dilation that results from the difference in gravity at the Earth's poles versus the equator. Being deeper in a gravitational field, which the poles are, causes your clock to tick by more slowly, just as moving faster relative to a stationary observer does.

If you want to account for the rate at which the passage of time will appear to occur for each and every observer, both the relative motion effects of special relativity and also the relative effects of gravity — i.e., the relative curvature of spacetime between multiple observers — must be taken into account.

Time dilation was one of the few relativistic phenomena that was actually predicted even before Einstein put forth the ideas of special and general relativity, as the consequences of motion close to the speed of light for distances (length contraction) was worked out in the 19th century by George FitzGerald and Hendrik Lorentz. If distances changed, then in order to maintain the proper working of physics that we knew for electrons in atoms (as shown by Joseph Larmor in 1897) or for clocks in general (as shown by Emil Cohn in 1904), that the same factor — the Lorentz factor (γ) — must factor into time equations as well.

Although this was very difficult to measure initially, our growing understanding of the subatomic world soon made it possible. In the 1930s, the muon, a subatomic particle that's the heavier, unstable cousin of the electron, was discovered. With a mean lifetime of just 2.2 microseconds, muons that are produced from cosmic ray collisions in Earth's upper atmosphere should all decay within just hundreds of meters. And yet, if you hold out your hand, about one such muon passes through it with every second, indicating that they journeyed somewhere around 100 kilometers: a feat that's physically impossible without time dilation. As soon as we developed the technology of cloud chambers, these muons could easily be seen even by the naked eye. *Cont'd next page...*



Flying Clocks Continued...

Other experiments further demonstrated that time dilation was a very real phenomenon for subatomic particles.

The 1932 Kennedy-Thorndike experiment showed that both length contraction and time dilation are required to explain the motion of light through different directions in space; this represented an improvement over the earlier Michelson-Morley experiment, which required length contraction alone.

The Ives-Stilwell experiment measured the Doppler shift of light and tested it against the predictions of special relativity; it was the first laboratory confirmation of time dilation, arising from positively charged hydrogen ions, and showed that the Lorentz factor was the correct factor for time dilation.

And in 1940, the Rossi-Hall experiment experimentally measured the relativistic decay of muons in the atmosphere, quantitatively confirming special relativity's predictions for time dilation.

But Einstein's original goal of using run-of-the-mill clocks at or near the surface of Earth to test the validity of special relativity still remained unfulfilled. Two developments occurred in the 1950s, however, that finally brought the idea within the realm of testability.

The first development that would make such a test possible had long been in the works: the invention of the atomic clock. Previously, the most accurate timepieces involved either quartz clocks or mechanical clocks. However, as the temperature changed, they became less and less accurate, leading many to search for an alternative. Originally suggested by James Clerk Maxwell and later developed further by Lord Kelvin and then Isidor Rabi, the idea of using an atom's vibrational frequency to keep time suddenly leapt into the realm of practicality.

Every atom has a series of energy levels that its electrons are allowed to occupy: those specific levels and no other. However, due to quantum mechanical effects — such as the quantum mechanical spins of the electrons and nuclei interacting with the electromagnetic fields generated by the electrons in motion — some of those energy levels split, creating fine-structure and hyperfine-structure with very small energy differences. When the electrons transition from a slightly higher energy level to a slightly lower one, it will emit a photon of a very specific frequency. By inverting the frequency, you can arrive at a value for time, and therefore, you can use properly prepared atoms to keep time. This is the idea and implementation of modern atomic clocks: currently the best device for timekeeping known to humanity.

However, if you wanted to travel at high speeds in a single direction and return to your starting point, meeting up with an observer who's been stationary the entire time, there's another confounding factor at play: the Earth's uneven terrain. You'll probably have to change elevation, and that's true whether you drive or walk or sail or fly. The problem is this: when you change elevation, you're now a different distance away from the center of the Earth, and that changes how severely the fabric of space is curved. As the curvature of space changes, so does the effect of gravitational time dilation: the component of time dilation that requires general relativity to account for it.

That's why it's so important that, in 1959, the Pound-Rebka experiment was performed. While the most stable isotope of iron is iron-56, with 26 protons and 30 neutrons, you can also make iron-57, with one additional neutron. Depending on whether it's in an excited state or not, iron-57 can either emit or absorb gamma rays of a very specific energy: 14,400 electron-volts.

At the bottom of Harvard's Jefferson laboratory, an emitting sample of iron-57 was placed, and at the top an absorbing sample of iron-57 was placed. As the emitted gamma-rays climbed up out of Earth's gravitational field, they lost energy, and therefore none of them were absorbed at the top of the lab. However, when a speaker cone was added to the emitting sample at the bottom, the emitted photons were "kicked" with an additional amount of energy. When the energy matched the energy lost via gravitational redshift, the photons were indeed absorbed at the top of the tower, demonstrating that the frequency shift observed matched up precisely with that predicted by Einstein's general relativity.

Cont'd next page...

Flying Clocks Continued...

As is often the case, however, it took a few brilliant minds to piece together the idea for how such an experiment would work, even though the detection of such a small, precise effect was now theoretically possible. Physicist Joseph Hafele realized that if you took an atomic clock — one of the then-modern, precise, cesium-133 versions available at the time — and brought it aboard a commercial airliner that was capable of flying completely around the world in a single flight, you could tease out both the effects on time dilation of special and general relativity.

After giving a talk on the idea where astronomer Richard Keating was in the audience, Keating approached Hafele and told him about his work with atomic clocks at the United States Naval Observatory. A short while later, the funding arrived from the Office of Naval Research, as Hafele's ideas would prove to be one of the most inexpensive tests of relativity ever to be conducted; 95% of the research funding was spent on round-the-world plane tickets: half for the scientists and half for the atomic clocks that would occupy the seats.

The brilliance of this idea is that it wasn't just, "Hey, let's fly this plane around the world and see if time dilates the way that special and general relativity predict that they ought to." In and of itself, that would've been completely sufficient to test Einstein's theories for time dilation directly.

But instead, Hafele and Keating both metaphorically and literally went the extra mile. First, one clock remained on the ground at the original location, ticking away and keeping time as accurately as possible: to within a few tens of nanoseconds over the timescale of weeks.

Second, two clocks were brought aboard a round-the-world flight, where they flew around the world in the eastward direction: the same direction as Earth's rotation. Because the plane's motion and Earth's rotation were in the same direction, velocities added, and so its additional, more rapid motion through space should mean that less time passed, with time dilation predicting a loss of time.

And finally, those clocks were then brought aboard a round-the-world flight moving westward: against the Earth's rotation. These planes flew slower than Earth's rotation, so the clock on the ground actually moved faster than the westward-moving plane. The less-rapid motion through space should mean that more time passed for this clock, relative to the eastward-moving clock and also to the stationary one on the ground.

At the conclusion of the experiment, the results were revealed and compared with expectations. The clock that was on the ground the entire time would be treated as "at rest," and everything else that occurred would be both predicted and measured relative to that standard of reference.

Although both clocks were meant to fly along similar courses at similar altitudes, such plans are rarely realistic. That's why the flight crew helped take measurements of the plane's location all throughout its dual journeys, allowing for both the predicted gravitational time dilation and the predicted due-to-motion time dilation to be quantified.

For the eastward-moving plane, it was predicted that 144 nanoseconds would be gained by the clock due to gravitational time dilation, but that 184 nanoseconds would be lost owing to time dilation from its motion. All told, that's a predicted loss of 40 nanoseconds, with an uncertainty of ± 23 nanoseconds.

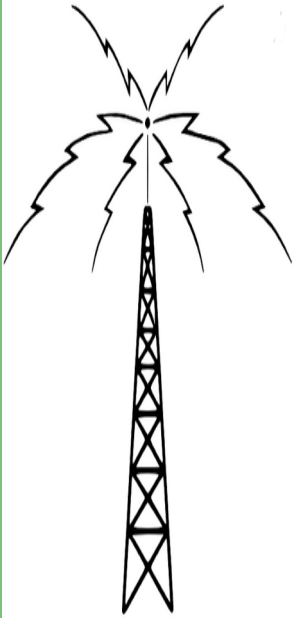
For the westward-moving plane, which flew at an overall higher altitude, a predicted 179 nanoseconds would be gained from gravitational time dilation. However, its lesser motion through space led to a prediction of a further gain of 96 nanoseconds, for a total predicted gain of 275 nanoseconds, with an uncertainty of ± 21 nanoseconds.

And finally, the measurements, as first reported in *Science* in 1972 — a full 50 years ago — showed a net loss of 59 nanoseconds (with an experimental uncertainty of ± 10 nanoseconds) for the eastward-moving plane and a net gain of 273 nanoseconds (with an experimental uncertainty of ± 7 nanoseconds) for the westward-moving one.

Although this initial experiment only confirmed the predictions of special and general relativity to within about 10%, it was the first time that time dilation had been tested for large, macroscopic objects using something as precise as an atomic clock. It showed, convincingly, that Einstein's predictions for both the motion component of relativity and also for the gravitational component of relativity were both necessary and both correct in their description for how time ought to pass. This, today, has applications ranging from GPS to radar tracking to measuring the lifetimes of subatomic particles and more.

Big Think May 17, 2022

MCARC Repeaters



Call	Location	Function	Repeater Input	Repeater Directories		Band
				Repeater Output	CTCSS (PL)	
W8EOC	Medina (Main Site)	Repeater TX & RX	147.630	147.030	141.3 One beep	2 Meter
W8EOC	Brunswick (North)	Receive only	147.630	From Main Site	131.8 Two beeps	2 Meter
W8EOC	Lafayette (South)	Receive only	147.630	From Main Site	88.5 Three beeps	2 Meter
W8HN	Medina	Digital C4FM TX & RX Repeater	147.885	147.285	(0)	2 Meter
W8HN	Medina	Analog TX & RX Repeater	147.885	147.285	(110.9)	2 Meter
W8EOC	Medina	Repeater TX & RX	223.260	224.860	-	1.25 Meter
W8EOC	Lafayette	Repeater TX & RX	449.925	444.925	131.8	70 CM

TRAVELING? Check out <https://repeaterbook.com/> for a free, worldwide repeater reference. It supports GMRS as well.

2-Meter Net

Remember to join us on the 2-Meter Net on 147.030 Monday evenings at 7:30pm except for 2nd Monday of each month when we have our **In-person** meetings. **On-Air** meetings will be held on those dates when Covid chases us to the airwaves. You do not have to be a member of MCARC to participate.

MCARC Monday Night 2-Meter Net Control

01-Aug-2022	KE8APO	08-Aug-2022	<i>Meeting</i>
15-Aug-2022	K8NVR	22-Aug-2022	WT8O
29-Aug-2022		05-Sep-2022	K2KSU

Contact Baji K8IIT, ohiobaji@gmail.com, if you would like to serve as NCO.

NCO openings can be found at:
<https://b.link/MCARC-NCO-2022>

MCARC Membership

Please become a member or renew your **Medina County Amateur Radio Club** membership. Dues are our primary source of income and are used to pay for the administrative costs of liability insurance, website domain registration fees, web hosting for www.W8EOC.org., maintenance costs of repeater and towers along with passing on fun perks to you, our members. Our new/renewal Membership Form and information can be found on our website <http://w8eoc.org/membership>.

ARRL Membership

Consider paying your dues for **ARRL membership** through our club Membership Chair, Diane KD8SSX. MCARC will retain \$15.00 for each NEW membership and \$2.00 for each renewal. A copy of the ARRL Membership Application/Renewal form can be obtained from Diane. Email her at d.snider@frontier.com.

Please consider volunteering. We really would enjoy seeing fresh faces and hearing new ideas to keep the MCARC relevant and viable in 2022. Do you like designing or maintaining websites, organizing speakers for technical sessions, writing for the newsletter or teaching members new skills? Please let Jane K8JGR know. Thank you.

Who's Who

President:

Jane Reed K8JGR
jane@K8JGR.radio
216-570-8500

VP: Gail Helwig KD8GGM

Treasurer:

Toby Kolman WT8O

Secretary:

Dave Swancer KE8APO

W8EOC Repeaters:

Ed Eyerdom K8NVR
Ken Koyan K8TV

Trustees:

Doug McClure KD8SST
Dave Oravec N8JNX
Ray Orobona K2RWO
Amy Panchumarti K2KSU
Ed Eyerdom K8NVR

Sunshine:

Diane Snider KD8SSX

Newsletter:

Jane Reed K8JGR

Field Day:

Fred Helwig K8FH

Membership:

Diane Snider KD8SSX

Websites:

Jane Reed K8JGR

Net Scheduling:

Baji Panchumarti K8IIT

Social Events:

Gail Helwig KD8GGM

Skywarn:

Tracey Liston W8TWL

ARES:

Bob Mueller K8MD

RACES:

Dave Rickon NF8O

Program:

Open



MCARC on the World Wide Web

www.W8EOC.org

Also,
"Like Us" on **Facebook**

[www.facebook.com/
MedinaCountyAmateur
RadioClub](http://www.facebook.com/MedinaCountyAmateurRadioClub)

Also,
Check out our **YouTube
Channel for Medina County
Amateur Radio Club**
Technical Session Videos

About Our Organization

The Medina Two Meter Group (M2M) Inc. DBA: the **Medina County Amateur Radio Club** is a nonprofit, ARRL Special Service registered, amateur radio organization based in Medina County, Ohio dedicated to communication, public service, education and fellowship.

Many of our members are also involved with Skywarn, ARES, RACES, and assist with community events such as bicycle and foot races.

We usually meet on the second Monday of each month at either the Medina County Senior Center (Sr) or the Medina County Career (JVS) Center.



Medina Two Meter Group (M2M) Inc.
DBA:
Medina County Amateur Radio Club

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Brunswick, Ohio 44212

Admin@W8EOC.org

PLEASE
PLACE
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TO: