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MARCO's "AETHER" Pronounced "Ether"
Healthcare & Radio in One Medium
The Medical Amateur Radio Council

140th
Edition
2000-2023



A non-profit Corporation, founded in 1966, privately supported for the public good and dedicated to the advancement of Medicine through Amateur Radio.

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Annual Session Edition

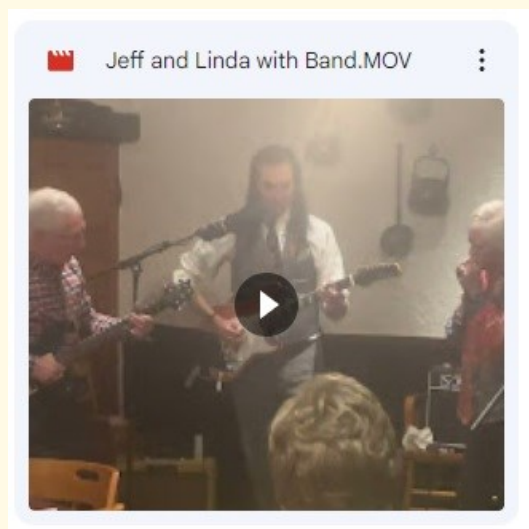
Live Annual Business Meetings are part of MARCO's heritage. While in-person meetings have waned since the COVID-19 pandemic, substituted by remote versions, our meeting includes a weekend of events that cannot be replicated from afar. The March 2023 business session was a hybrid event, with in-person and remote participation, as displayed in the pages of this edition of the *Aether*. As you peruse the pages, and view the links to videos of the event, please consider the comradery and enjoyment that you missed by not attending. Please mark your calendar now for our 2024 MARCO Annual Meeting to be held in the Dayton/Xenia OH area May 16-19 next year for attending an extended weekend of activities and old-fashioned HamVention fun!



Top photo-Image of the 2023 annual business meeting layout that allowed for remote Zoom participation.

[Bottom left video \(click to view\)](#) - President Bernie KD5QHV and President-Elect Barry WB1FFI preside over the annual business meeting.

[Bottom right video \(click to view\)](#) - Past-Presidents Jeff Wolf K6JW and Linda KE5BQK sat in with the Sam Barlow and the True Blues Band for an evening of entertainment at our annual banquet.



Annual Meeting Highlight Continued...



Upper Left—The Linds flying high at the US Border Patrol Museum in El Paso.

Upper Right—President Bernie describing airplane information to Past-Presidents Jay and Mary at the War Eagle Museum in NM, just across the state line from El Paso.

Left—Our MARCO Annual Banquet Cattleman's Steakhouse at the Indian Cliffs Ranch, Fabens, TX. We were treated to a blues band performance of [Sam Barlow and the Trues Blue Band](#) courtesy of President Bernie and Past-President Linda Krasowski.

Bottom left—and the Garlitzs and Rabins arriving at the annual banquet venue. Barry WB1FFI will be installed as MARCO President in 2024.

Bottom right—Past-President Mary AE4BX and husband Lou enjoying the displays at the Border Patrol Museum in El Paso.

[Click on photos for venue Web links](#)



Rambling Around with Warren Brown, KD4GUA

This is the first co-produced version of the Aether, a joint effort by Warren Brown and Jay Garlitz. Warren has renewed a popular column from his years of journalism as part of this effort, *Rambling Around with Warren Brown*.

April 2023's Ramblings...

The *Harvard Men's Health Watch* offers some interesting articles from past research...for example: Men who start taking statins in their 70s have fewer heart attacks. In a study looking at 326,981 mostly male veterans ages 75 and older, who did **NOT** have cardiovascular disease and **did not take** statins, it was found that statin users had a 25% lower rate of death and a 20% lower rate of death from stroke compared to those not taking them. Therefore, it is never too late to start taking statins.



Another finding...! **Does alcohol affect A-fib?** A study in the *New England Journal* revealed you can cut your atrial fibrillation episodes almost in half by cutting out most alcohol, a common trigger.

A-Fib increases your risk of stroke and cutting down on alcohol lowers the number of episodes. And those who make the change also can lengthen the time in between A-fib episodes. How much should you cut? In this study, the greatest benefits were in men who lowered their consumption from 7 drinks per week to 2 drinks per week on average.

Does general anesthesia raise your risk of dementia? Even though older adults often experience temporary cognitive changes in memory and thinking after general anesthesia...research has shown no link between general anesthesia and dementia risk.

Cut your risk of death from heart problems 56%...with one simple change....Research showed when taking blood pressure meds at bedtime instead of in the morning subjects were 34% less likely to suffer a heart attack, 41% less likely to suffer heart failure and 56% less likely to die from heart problems.



A study in the American College of Cardiology found that among people aged 40-69, those who slept fewer than 6 hours had a 20% higher risk of having a first heart attack compared to those who slept 6-9 hours. Too much sleep isn't heart healthy either. Those who slept more than 9 hours had a 34% higher risk. Try to get at least 7 hours of restful sleep.

Can you get a stent well into your 80s? Most cardiologists say YES in most cases. If stents make you a little nervous you should know that bare-metal stents are a thing of the past. Back then up to 25% of arteries treated with them would close up after about 6 months. Today cardiologists most often use *drug-eluting stents* which are coated with a medicine that keeps blockage from returning by inhibiting the scar tissue from forming inside the stent, a major problem with bare-metal.

Too many steroid shots can worsen pain and harm your knees, hips or back...pain from arthritis, bursitis or tendinitis can interfere with your quality of life and activities you enjoy. A study showing that of 459 people who received between one and three injections in their hip or knee...about 8% experienced a worsening of their condition after 7 months. And, they experienced greater bone and cartilage loss. Remember also, adults with high blood pressure or diabetes can both get a rise for a few days after the shot. Also anyone taking blood thinners {*anti clotting drugs*}—you may need to stop them a few days prior to your shot to reduce potential bleeding or bruising.

Stop putting off cataract surgery: you'll be a safer driver. Crashes and near-misses went down 35% after both eyes were corrected? Incidents dropped 48%.

A good reason to get your shingles vaccine: Researchers recently found those who were vaccinated for shingles were 10% to 20% less likely to have a stroke.

Have urine dribbling? Try this: To stop the dribble, right after your urine stream stops, "*milk* out" the last few drops. Place your fingertips on one hand about one inch behind the scrotum and gently press upwards. Keep applying pressure as you move your fingers toward the base of the penis under the scrotum. Repeat once or twice, then shake out the last few drops.

DESKTOP MRI

Two-Dimensional MRI Imaging Using a Desktop Imager

Submitted by David Lieberman KT8E

Introduction

Magnetic resonance imaging (MRI) is a medical imaging technique that uses a magnetic field and computer-generated radio waves to create detailed images of the organs and tissues in the body. In the clinical setting, the patient is placed inside a powerful magnetic field aligning hydrogen ions in the direction of the magnetic field. RF pulses change the direction of alignment of these hydrogen ions and the signals emitted as the ions return to equilibrium can be used to construct images.



TerraNova 2D MRI Imaging System components

The Biomedical Engineering class at the Newark California campus of DeVry University had an opportunity to explore the principles of MRI using a “desktop” scanning system manufactured by TerraNova. It leverages the biggest magnet on our planet -- the earth. The imaging results from this modest piece of equipment are amazing. The components of this system are shown on the left.

A Brief Theory of MRI Part 1 – NMR Comes First

**** WARNING: There is some math discussed here ****

In a nutshell, MRI imaging is a combination of NMR (Nuclear Magnetic Resonance) and application of Gradient Magnetic Fields. Let’s take these ideas one

-at-a-time.

Nuclear magnetic resonance is the property of electrons to radiate a signal when they are energized by radio waves at their precession frequency. This is illustrated in figure 1.

In figure 2, samples are energized by the RF input coil. When the RF input coil stops transmitting, the RF output coil receives signals from the hydrogen atoms in the sample and their resulting frequency spectrum analyzed. The characteristics of the spectrum can be processed by an FFT (Fast Fourier Transform). NMR is often used in the field of crime forensics to analyze the contents of unknown samples.

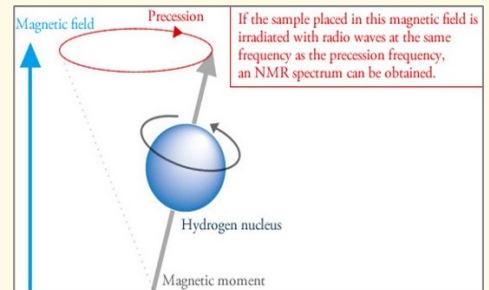


Figure 1: Nuclear Magnetic Resonance

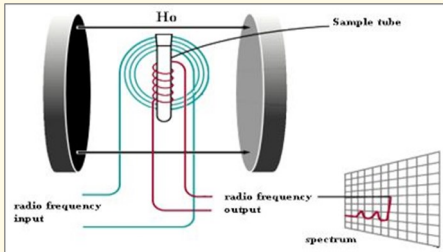


Figure 2: Nuclear Magnetic Resonance Signals

A Brief Theory of MRI Part 2 – Apply a Gradient Magnetic Field

Figure 3 illustrates the “secret sauce” of MRI imaging. In the top row, a uniform magnetic field is applied to the sample and all the protons emit the same signal.

However, in the bottom row, a gradient magnetic field has been applied to the sample. “Gradient” simply means that the magnetic field is stronger on one end and weaker on the other end. The field strength decreases in a linear fashion.

The gradient field causes the frequency of the emitting protons to shift. THIS IS THE SECRET SAUCE! By decoding the frequency of the peaks, one can figure out WHERE the signal came from in space.

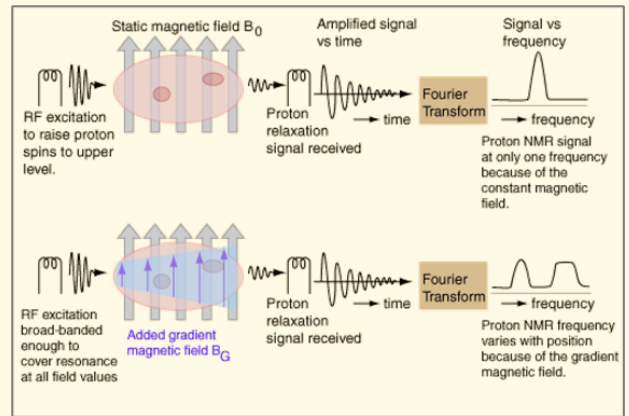


Figure 3: Application of a Gradient Magnetic Field

Continued from page 4

A Brief Theory of MRI Part 3 – Apply a Gradient Magnetic Field in 3 Dimensions

Figure 4 illustrates the construction of a conventional MRI scanner used for medical imaging. Note there are 3 sets of coils for generating a magnetic gradient – one in each plane of three-dimensional space. Computers can analyze the cumulative data from the received signals in three dimensions and produce what we classically refer to as “MRI” images.

The TerraNova Imaging Coils:

Figure 5 illustrates the imaging coils surrounding the 2D MRI scanner’s sample chamber. The two smaller coils fit perfectly inside the large coil like a Russian Matryoshka (stacking) doll. The polarization coil is essentially an electromagnet. When energized, it amplifies the earth’s magnetic field to align the spins of the atoms in a uniform N/S direction. The Gradient coils (there are several of them wrapped around the cylinder) create the Gradient magnetic field which is vital to spatial imaging. The B₁ coil acts as both the RF transmitter and receiver. It generates the RF signal to excite the atoms and receives the emitted signals.

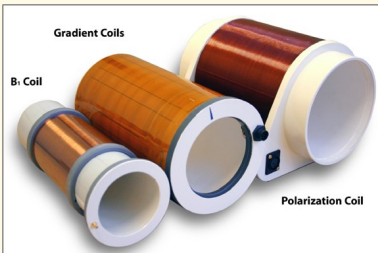


Figure 5: 2D Imaging coils

electrical fields generated by passing vehicles can have an adverse effect on signal reception.

Figure 6 illustrates the setup of the MRI scanner for the experiments conducted in this article. BMET students traveled to a place with very low ambient electrical activity. The scanning chamber was positioned several feet away from the structure.

One of the first procedures is to monitor the ambient noise. If the noise level exceeds 10.0 μV rms (root-mean-square) it is very difficult to acquire good images. Here, the team has identified a location that has very minimal noise. Moving the scanner just six inches can have a dramatic impact on the noise level.

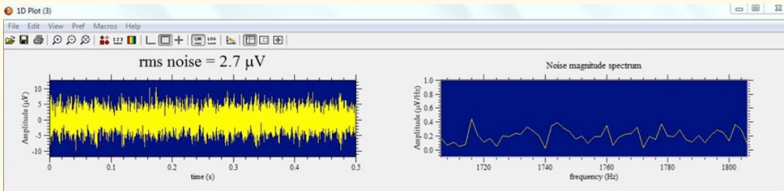
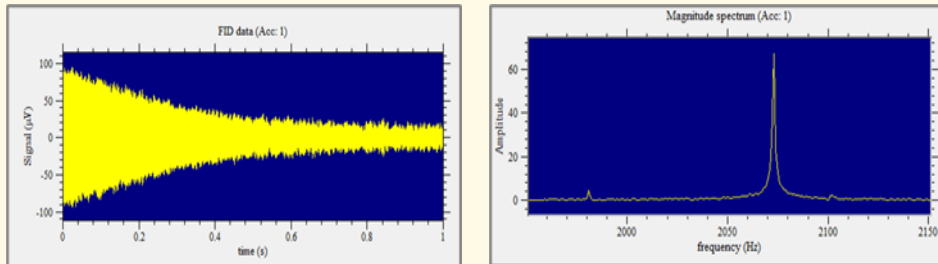


Figure 7: Results of the Monitor Noise Experiment

The “Pulse” and “Collect” procedure injects an RF pulse into the sample and then collects the signal that returns. A plastic bottle filled with H₂O is placed inside the scanning chamber and the results are shown below. As discussed in the next section, water provides the best signal-to-noise ratio for detection:



[The remainder of this article can be viewed by clicking here](#)

Editor’s note (Jay Garlitz): As amateur radio operators we use the radio spectrum to communicate. Radio waves, RF, coils, and reducing noise have applications in our hobby. Many current and potential hams have talents to push the boundaries of scientific knowledge through experimentation. As you read this article note the many keywords that have parallels in your daily radio operation. Identify others in your group of colleagues and friends who might enjoy becoming amateur radio operators and invite them as an Elmer to join our hobby!

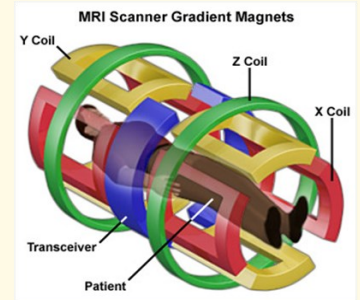


Figure 4: Magnetic Gradients in 3 Dimensions

Beating the Noise Problem:

The signals from the B₁ coil are very small. It is imperative to locate the MRI sample chamber in an electrically noise-free environment. That is quite a challenge in this day and age! Even the



Figure 6: Locating the scanner in a “noise-free” environment

A Simple NMR Exercise – Pulse and Collect:

As the saying goes, you crawl before you walk. Before attempting to generate MRI images, the first step is to ensure collection of good NMR signals.

The results of the NMR scan are promising. The signal magnitude ranges from minus to plus 100 microvolts. The decay time of the signal is nice and extended – greater than half a second. Also notice the squeaky-clean frequency response. Remember – we need to measure frequency in order to build images. According to the manufacturer of the scanner, these results are ideal for 2D experiments.

Minutes of the MARCO Annual BOD Meeting El Paso March 24, 2023

[\(View session video recording by clicking here\)](#)



Call to Order: 9am Mountain time

Introductions: Present live, President Bernie Krasowski KD5QHV, President-elect Barry Rabin WB1FFI, Secretary Jay Garlitz, AA4FL, Treasurer Chuck Lind N8CL, Past-President and 4th call director Mary Favaro AE4BX, Past-President and 5th call director Linda Krasowski KE5BQK, Past-President and current Medishare director Arnold Kalan WB6OJB, Past-President and director at large Jeff Wolf K6JW. Present online (Zoom, hybrid session): 2nd call director Diane Rodman NM2K, 9th call director Stuart Oserman WA9ZPL, Past-President and net/Web director Chip Keister N5RTF,

Harry Przekop WB9EDP, and Merrill WW6AA.

Minutes of 2022 Annual Meeting: Approved with one correction (Flex radio model at UF potential Grand Rounds site). Motion to approve—Arnold WB6OJB, 2nd-Harry WB9EDP, unanimous vote for approval as revised.

President's Report: Bernie KD5QHV discussed the Grand Rounds as a method of keeping our members up-to-date on topics, but not as CME since there was little demand for it from members. He requested as Warren steps back gradually from running the Grand Rounds that many individuals come forward to assist with Grand Rounds and work with President-elect Barry WB1FFI in making this transition a priority.

Secretary's Report: Jay AA4FL reported most of his items were on the agenda in different areas. He stated leadership, as to need for a new generation of leaders, should be established while maintaining the past leaders for input. The changes in cessation of CME issuance for the Grand Rounds was introduced, to be discussed under net reports. Jay mentioned a perception of too much of the organization activity running through the secretary and noted volunteers, including a potential assistant secretary, are desired so the activity can be spread out.

Treasurer's Report, IRS filing report: Chuck N8CL went over the financials, report were distributed. Jay AA4FL mentioned form 990-N had been submitted to the IRS (tax filing). Noted was that checking account balances reflect that we have many five year members so the administrative account seems large but must cover expenses in a five year time frame. Signatories discussed and motions need to be made to appoint a new signatory. Past-President Bruce Small desired to be removed from the signatory list.

Medishare Report: Arnold WB6OJB Medishare donations were discussed, difficulty in asking for donations. The balance explained as the activities checking account includes designated funds, those dedicated for Medishare, one for scholarships, one unallocated. (explanations treasurer Chuck N8CL, Secretary Jay AA4FL). President-Elect Barry WB1FFI brought up medical equipment donations, a desire to renew that activity that was more common in the past.

Net Report, Ad hoc Committee on Grand Rounds, Digital Net, outside nets: Net director Chip N5RTF discussed the future of the Grand Rounds, as described in detail in the video recording of the meeting. (link above). He sees many volunteers rotating in program presentation and technology for remote involvement assisting in overcoming the limitations of a HF net. CME of past discussed as not being a component of future plans. The roundtable discussion format was discussed. CW and digital net were discussed as well.

Aether Report: Warren KD4GUA was not present, co-editor Jay AA4FL gave a report of the status of the Aether. Warren has decided to make the Aether online only editions, no longer printed and mailed. He has asked me (Jay) to be co-editor of each of the editions, and Warren will contribute material that Jay will incorporate on his behalf into the digital design.

Google Group Report: Jay AA4FL made a report during the Aether discussion. He also explained distribution emails such as directors and officers at marco-ltd.org.

Webmaster's Report, MARCO domain report: Dave KT8E was not available. Jay AA4FL provided some information about our domains and hosting, with Jay, Chip, Dave having access to our godaddy hosting account. Request for an online self-entered directory in a secure members area discussed.

Membership Committee Report; Alanna K4AAC and Jay AA4FL are on the committee. Alanna was not available so Jay reported on how applications are received and processed.

Minutes continued from page 6

Hamfest Report: Manpower/volunteers for hamfest booths were discussed as limiting factor. The concept of alternating annual meetings at the location of the Presidents choice was discussed as negatively affecting manpower. Approved was alternating between Dayton/Xenia and a second Hamfest as an alternative, with the second one being Orlando HamCation and a West Coast Hamfest on some years such a Pacificon. There would still be opportunities to have purposeful get-togethers such as contests at members stations, and Dxpedition get-togethers. The discussion will be continued, no motion made.

New Business:

WB5D Trustee Transfer: Jeff K6JW has decided to step back as FCC trustee for call sign WB5D and has completed paperwork, awaiting our approval and the appropriate signatures, for David Rodman KN2M to become the trustee. Such was approved and is being reflected in the minutes to forward with the application for transfer. Jeff made the motion for the transfer, seconded by Jay AA4FL. Jay will update the QRZ page information once the FCC database is updated. A vote to approve the transfer was unanimous.

New Treasurer: Chuck N8CL has requested to step back from being treasurer. Only one candidate came forth, Diane NM2K, and she was moved as replacement after nominations were closed in a motion by Arnold Kalan WB6OJB, seconded by Mary Favaro AE4BX. The election was approved unanimously.

Signature Cards Bank Accounts: With discussion it was requested that Chuck remain on as an assistant treasurer (allowed per our by-laws), with he still being a signatory on the Bank of America checking accounts. It was also pointed out that the President changes every two years and was not required to be one of the signatories. The decision was made to have Jay Garlitz (AA4FL), Chuck Lind (N8CL) remain as signatories, Bruce Small (KM2L) be dropped as one and as the third signatory be replaced by the addition of Diane Rodman (NM2K). The motion was made by Arnold Kalan WB6OJB and seconded by Mary Favaro AE4BX, and approved by a unanimous vote, as was with Diane's election as treasurer.

Call District 2 Director replacement : Since Diane has become treasurer a new 2nd call district director is needed. David Rodman KN2M has moved to become the 2nd call district director, motion made by Diane NM2K, seconded by Bernie KD5QHV, and approved by a unanimous vote.

Board of Director Insurance: Discussion was held noting that we do not have this type of insurance. In regard to what can be done immediately, for the net it was suggested we add a disclaimer to our preamble noting that discussion and comments made are personal in nature, not the views of the organization, and that our venues are information as a public service, not medical opinions. The same was decided for the Website. Stuart WA9ZPL had the most experience of our group in being aware of the availability of BOD insurance products and was named to chair a committee to evaluate cost and need. Jay AA4FL and Diane NM2K were added to the ad-hoc committee.

ARRL Affiliation: Desirability of MARCO becoming an ARRL affiliated club, in tandem with forming the ad-hoc committee for BOD insurance, since the ARRL may make such policies available, motion was made by Diane NM2K, seconded by Jay AA4FL, and approved unanimously. Jay will contact the ARRL and submit an application.

Adjourn: 10:36am Mountain time



The photo on the left is of President-Elect Barry Rabin WB1FFI and his wife Susan.
The photo on the right is Barry and current President Bernie Krasowski KD5QHV.

Autopsy, will it Survive? A Bob Currier Grand Rounds on the Air topic

The topic for The *Grand Rounds on the Air* net on February 26 2023 was on *Autopsy*. The on-the-air discussion was informed by the background material as follows, sourced from Sanchez and Collins, *Medscape*, July 2019, as presented by Warren KD4GUA. [Click to listen the a recorded audio stream](#) of the net.

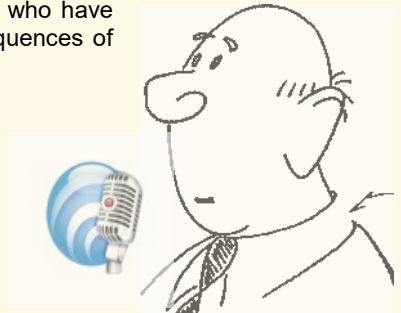
Before 1979, approximately 40% to 60% of all hospital deaths in the U.S. ended in autopsy: in more recent years that number has decreased to below 5%. Worldwide autopsy rates have declined steadily since the 1950s—and there is no evidence to suggest that the trend will change.

Fictional pathologists are often medical examiners (MEs), frequently caricatured as eccentric tortured geniuses who work in dramatically lit morgues and draw astonishing conclusions from autopsies. The majority of US pathologists typically work in community hospitals attending to surgical specimens and cytology studies, and taking care of administrative obligations; performing surgical specimens and cytology studies, taking care of administrative obligations; as performing autopsies is an increasingly rare occurrence. Indeed, many community pathologists' regard the autopsy, once an important part of educational patient care, and quality assurance missions of of a hospital pathology department, as an unexpected and irritating interruption from their busy routine.

The medical and lay press have debated the significance of the decline in hospital autopsy rates and offered a wide variety of explanations. At one end of the spectrum, some authors have characterized the autopsy as a vestige of a bygone medical era that has largely been supplanted by non-invasive techniques. At the other end are those who have insisted on the continued clinical relevance of the autopsy and warned of the dire consequences of under utilizing it.

We will discuss the current state of the autopsy with respect to autopsy rates, several explanations for the current decline in autopsy rates, the current benefits of autopsy, physician attitudes toward autopsy, and suggestions for improving autopsy rates.

Rates of Autopsy...Medicolegal autopsies are performed by forensic pathologists or coroners as mandated by local statutes, typically in cases of suspected homicide, suicide or accident, and (unlike hospital autopsies) they do not require permission from the next of kin. Most jurisdictions collect reliable data on their medicolegal autopsies, and statistical data suggest that rates of medicolegal autopsies have increased.



Each hospital autopsy rates are more difficult to delineate owing in part to a lack of standards regarding definitions and data reporting. Autopsy rate reporting may vary between institutions depending on whether forensic cases, stillbirth cases, and cases referred from outside the hospital are included. There is general agreement, however, that autopsy rates have decreased substantially over the past decades in the U.S. Data from the U.S. National Center of Health Statistics (NCHS) have shown that the overall autopsy rates (i.e.. medicolegal plus forensic cases) decreased from 19.1% of all deaths in 1972 to 8.5% in 2007. These figures become even more striking when one separates the statistics for hospital and medicolegal autopsies. Although the medicolegal autopsy rate for the 35 year period rose from 43.6% to 55.4%, the hospital autopsy rate fell from 16.9% to 4.3%.

Autopsy rates outside the U.S. have also decreased precipitously. In Australia, the rate decreased by about 50% between 1992 and 2003. Data from the Danish National Institute of Health showed a decrease in autopsy rates from 45% in 1970 to 16% in 1990. and data from Halifax, Nova Scotia, showed a reduction of clinical autopsies from 30% in 1987 to 20% in 1999. In the United Kingdom, clinical autopsy rates plummeted from 25.8% in 1979 to an abysmal .69% of all hospital deaths in 2013.

Reasons for the Decline in Autopsy Rates...The decline in autopsy rates represents the intersection of several changes that have taken place in the field of medicine. One such change is the shift in care toward treating older and sicker patients who are dying in long-term facilities and in hospice care settings. However, the most important change to affect autopsy rates have occurred in the realms of healthcare economies, professional standards, and medical technology. No financial incentives currently exist for either the hospital or the pathologist to perform autopsies because reforms in health care offer coverage and reimbursement have inessentially eliminated direct funding for autopsies altogether. The cost of an autopsy is not included by managed care organizations or by third- party insurers'. (*Cost estimates tun from \$70 to \$7000.*)

Continued on page 9

Continued from page 8

Although the AMA has assigned procedural codes (CPT), there is no assigned relative value for autopsies. As a result, the pathologist cannot bill for either the technical or professional component of an autopsy in the same manner they can bill for other lab services. Some hospitals—especially teaching hospitals—will absorb the expense. In other situations, the resulting cost may be passed on to the next of kin of the deceased at the discretion of the hospital or individual pathologist performing the procedure.

No specific reimbursement figure exists for autopsies under the Medicare resource—based relative value scale (RBRVS) fee schedule. The federal government technically funds autopsies as part of a fixed annual payment made to hospitals to cover a variety of services. This system implicitly incentivizes hospitals not to perform autopsies and instead retain the leftover revenue for other overhead costs they determine to be more valuable.

Support for the hospital autopsy can be found in professional medical societies and in the medical literature, but no formal benchmark exists for an acceptable hospital autopsy rate. For decades none was necessary. After Abraham Flexner's scathing indictment of medical education in 1910, American medical schools adopted the German model of medical education which clinical pathological correlation and the autopsy were central elements. Academic physicians promoted the autopsy as a research and teaching tool. Community hospitals largely followed suit. For a time a hospital's autopsy rate became a marker of its commitment to quality medical care. By the end of the Second World War, nearly half of the people who died in American hospitals underwent autopsy, and the rate in teaching hospitals was often much higher

The subsequent decline probably began in the 1950s with the dramatic rise in federal funding for medical research. As academic success became defined by the ability to secure Federal grants for lab research, interest in autopsies waned. As early as 1956 an academic cardiologist commenting on this trend said. *"What wonder that the new professor of pathology...has washed his hands of the...routine autopsy."*

The often mentioned Joint Commission on Accreditation of Healthcare Organizations (JCAHO; now called **the Joint Commission**) accreditation requirement of a 25% autopsy rate for teaching institutions and a 20% rate for non-teaching institutions was not implemented until 1965 and was only in place for about 6 years. Following the advent of Medicare and Medicaid, the downfall of the doctrine of charitable immunity for hospitals, the JCAHO completely overhauled its standards in 1971, and abolished many of its numerical benchmarks in the process—including the autopsy rate requirement. It was felt that hospitals were unselectively using autopsies to meet arbitrary target rates, without utilizing the information derived as intended to assess quality and improve hospital care. The JCAHO reached this decision after extensive study and with the input of hospital administrations, clinicians and pathologists. They believed that hospitals and physicians themselves could be relied upon to decide on an appropriate autopsy rate. The precipitous change in the slope of the already-declining hospital autopsy rate after 1971 suggests that this confidence was misplaced.

Technical Advancements... There is a narrative in the literature that suggests that the decline in the hospital autopsy rate is part of an evolutionary process, the natural result of improvements in less-invasive medical technology. The idea is that better lab testing and improved medical imaging has improved diagnostic accuracy to the point that postmortem confirmation is no longer necessary in the vast majority of cases.

A couple of things should be noted. First the medical literature has consistently shown that hospital autopsies uncover clinically important and unsuspected diagnoses in a significant fraction of cases. Even in patients who have received an extensive diagnostic evaluation. Second, the autopsy rate began to decline in the 1950, decades before the widespread availability of the computerized imaging modalities that were credited with replacing it.

Benefits of Autopsy... The autopsy is instrumental in accurately establishing the cause and manner of death. It is unlikely that autopsies will completely cease. The need for autopsies persists in the field of forensics and research. New technologies, including full-body three dimensional (3D) imaging currently lack the sophistication to outperform autopsies, but they are employed as an adjunct to traditional autopsies and to enhance forensic autopsy examinations. **The autopsy will survive.**

Membership Committee Report

The membership committee requests your assistance in keeping MARCO's database up to date so all members data is current. We have tried a different approach this year regarding annual billing, making renewal self-initiated. In addition, we are a volunteer organization and processing renewals can be a huge task, potentially to be reduced by your compliance with the suggestions that follow.

With that in mind we sent group messages late last year about making dues payments, rather than waiting for emailed invoices. Our trust has been rewarded with a nice response, with many of you renewing, and extending your membership beyond your renewal term. (longer renewals are the best compliment you can offer and allow for reduced workload by our volunteer staff).

Membership dues, for new joins and renewals, are processed by email. Our online form allows you to renew and extend your membership for 1, 2 or 5 year terms (pull down list), with longer terms reducing the cost per year. There is a unified dues structure for associate and regular members. Please complete the entire form just as you were a new member as this assists us with keeping your information current in our membership database (contact phone number as well). Additional explanation is located on page 13 of this edition of the Aether.

MARCO encourages members to consider a five year membership of \$100. This reduces your yearly cost of membership and simplifies our annual billing by our all volunteer staff. Existing members can choose to extend your membership at any time. [Click for the online application](#) and if desired, select the five year term from the pull down list.

Once submitting the online form **if you have a problem with the form appearing not to submit** (spinning icon, known to occasionally occur), email the issue to Jay AA4FL at secretary@marco-ltd.org to confirm it went through. The membership committee will receive your online application and process an invoice to be sent by email. Once you open the invoice use buttons at the top left are present to credit card payments (Stripe), and for PayPal. If you prefer to pay by mail list such on your application

Thank you for your Membership!

In Service to MARCO and 73,

Jay AA4FL, and *Alanna* K4AAC

MARCO OFFICERS, 2023-2024

Contact info— mail and e-mail addresses are on QRZ.com.
E-mail is preferred, phone contact info is provided for the President and Secretary only.

President: Bernie Krasowski, KD5QHV
P: 915.449.0234

President-Elect: Barry Rabin, M.D., WB1FFI

Secretary: Jay Garlitz, D.M.D., AA4FL
C: 352.246.6003

Treasurer: Diane Rodman, R.N., NM2K

Assistant Treasurer: Charles Lind, M.D., N8CL

Web Master: Dave Lieberman, KT8E

Radio-Internet Coordinator: T. "Chip" Keister, M.D., N5RTF

MediShare Director: Arnold Kalan, M.D., WB6OJB

Newsletter: Warren J. Brown, M.D., KD4GUA

REGIONAL DIRECTORS:

(1st call district) Don Arthur M.D., J.D., K1DCA

(2nd call district) David Rodman M.D., KN2M

(3rd call district) Keith Adams, M.D., N3IM

(4th call district) Mary Favaro, M.D., AE4BX

(5th call district) Linda Krasowski, R.N., KE5BQK

(6th call district) Paul Lukas N6DMV

(7th call district) Lee Barrett, M.S.E.E., K7NM

(8th call district) Mark Young, M.D., N2OJD

(9th call district) Stu Oserman, M.D., WA9ZPL

(0 call district) Carlyle Rowland R.N., N0ARN

(Dx director) Etsuo Takada, M.D., JA0BXP

DIRECTORS-AT-LARGE:

Bruce Small, M.D., KM2L, Immediate Past-President

Arnold Kalan, M.D., WB6OJB,

Chip Keister, M.D., N5RTF

Jeff Wolf, M.D., K6JW,

Jerry Ziperstein, M.D., N4TSC

AD-HOC COMMITTEES:

Membership—Jay Garlitz AA4FL, Alanna Conder K4AAC, Michaline Przekop KC9ARP

Grand Rounds Net—Chip Keister N5RTF, Jack Spitznagel KD4IZ, Jerry K4TSC, Linda Krasowski KE5BQK, Harry Przekop WB9EDP

Historian: Michaline Przekop, KC9ARP

GREETINGS FROM YOUR PRESIDENT

April 2023

For those of you who missed it, the annual MARCO meeting was a resounding success. At this meeting we elected Diane Rodman, NM2K, Treasurer, and Chuck Lind, N8CL became Assistant Treasurer providing us redundancy which we've lacked for quite some time. Jeff



Wolf relinquished the trusteeship of the MARCO callsign, WB5D, and Dave Rodman assumed that responsibility in addition to becoming the second call area Director.

Jay did a survey earlier this year to see how many members were interested in going to Dayton/Xenia this year, and unfortunately, there was little or no interest. At the same time the booth items, i.e. the information board that was used in the booth was either destroyed or water damaged in a fire at Keith's N3IM house. Therefore, MARCO will not be represented at Dayton/Xenia this year. In the coming year we'll need to devise a plan and purchase whatever we need to present ourselves at future events.

As a side note, I'd like to THANK all those who attended the annual meeting or attended via Zoom. I reflected on the meeting and found something interesting as follows:

Members Present—Jay AA4FL, Jeff K6JW, Mary AE4BX, Arnold WB6OJB, Linda KE5BQK, Barry WB1FFI, Bernie KD5QHV, and Chuck Lind N8CL

Zoom Meeting attendees—Chip N5RTF, Harry WB9EDP, Diane NM2K, and Stu WA9ZPL

What I found was most everyone in attendance are past Presidents. Barry is President elect and I am currently serving as President. On the Zoom side both Chip and Harry are past Presidents of MARCO. You don't need to be a former President to attend the annual meeting, and I'll tell you those who attended had a BLAST!!! Thursday night we took everyone to Carlos & Mickey's for Mexican food! After the business meeting some attendees went out looking for boots and were quite successful. There was a banquet set for a King Friday night.

Did I mention music? Although one of the original members of the MARCO Blues Band was not in attendance, Jeff and Linda were. Linda's harmonica teacher Sam Barlow and his True Blues Band provided the night's entertainment. Jeff and Linda fit right in and the band played on!

On Saturday we toured the Border Patrol Museum and the Museum of Archeology. Then we went to lunch at Avila's Mexican restaurant, and then we drove out to the War Eagles Air Museum.

Jay and Randi spent the rest of their time trying to see how many miles they could put on a rent car in a long weekend driving to Alamogordo, Ruidoso, finding little green men in Roswell on Sunday, and going to Carlsbad Caverns on Monday. With the annual meeting behind us the next year should be smooth. My goal for this year's meeting was that all attendees would leave El Paso with a smile on their face, and based on what I observed, MISSION ACCOMPLISHED!

73, *Bernie* KD5QHV

**Annual MARCO Meeting
El Paso, TX, March 24**



Our gracious hosts for the 2023 Annual Meeting and wonderful banquet, replete with musical performances by a blues band and special musical guests Past-Presents Linda Krasowski on harmonica and Jeff Wolf on guitar.



MARCO Nets, 2023 updates

Weekly MARCO Medical Grand Rounds on the Air HF Net

The Medical Amateur Radio Council (MARCO) conducts its weekly *Grand Rounds on the Air* net on 14.342 MHz. (1500 UTC summer, 1600 UTC winter). Health Care professionals check-in to the net and engage through moderated (net directed) roundtable discussions on topics of interest, and have occasional continuing medical education (CME cat 2) presentations. Those present include physicians and dentists from many specialties, pharmacists, nurses, researchers (PhDs), EMTs, and members who serve in other health related careers. **All members of the amateur community and public are welcome to listen and submit questions** to the discussion panel using the AIM messaging feature in the freely available netlogger program (netlogger.org), aided by using the [livesteam of the net](#). This facilitates country and worldwide engagement of participants and listeners while negating the limitations of HF propagation.

MARCO Grand Rounds on the Air



Live audio stream and archives
WWW.MARCOAUDIO.NET

Founded in 1966, MARCO's mission is to promote goodwill and fellowship among amateur radio operators who are professionals in the healing arts or have an interest in medicine, dentistry, allied fields or in medical education and industry. On-the-air operation is an integral component of MARCO activities and is conducted for the purpose of discussion through exchanging medical and technical information of a non-commercial nature while conducting such dialogue as a public service of interest to the entire amateur radio community.

Livestreams and Net Recordings

Our Radio-Internet Coordinator Chip Keister, M.D., N5RTF, New Orleans, LA...[livestreams our net online](#). Check into our nets and earn CME. For times when propagation is poor when you would benefit from audio from another receiver, if you are away from your radio, in a skip zone, or unplugged due to thunderstorms, join the MARCO CW net and Grand Rounds by live [internet streaming audio](#). These are recorded to [listen in later to the online archive](#).

To Listen:

1. Use a browser to go to the following web page which has a player app and **links to the audio stream and archive:** www.marcoaudio.net.
2. The second way is to manually enter <http://marcoaudio.ddns.net:8011/stream> into a standard music player on computer, phone, or portable device **while the net is in progress**.

Feel free to share these links with anyone, MARCO member or not. No login or password is required. There is room for 100 listeners at a time. Comments are appreciated.

Chip N5RTF

MARCO International DV NET

The **MARCO International DV (Digital Voice) net** meets on Sundays at 1400UTC. It is the first of three Sunday morning nets and serves as the first place of roundtable discussion for the *Grand Rounds* topic of the day, while affording amateur radio operators without HF radio equipment, antennas, or those with technician licenses, and members in Asia (time of day), to participate while developing the topic for the HF net later in the day.

We have chosen to use the [QuadNet Array](#), an IRC or Internet Chat Facility that acts like a **universal translator between different digital modes** that allows hams who identify by callsign to connect with other users of digital radios world-wide through interconnected reflectors and talk-groups. See their website for more details, including how to connect, within the <https://www.openquad.net/> webpage.

This net applies the same format of, and augments MARCO's HF-based voice nets, providing a mechanism for members and guests worldwide to join discussions without the limitations of HF propagation, antennas, or equipment. Since operators can participate on radio while mobile through digital hotspots or repeaters, or at a fixed location by USB dongles on a computer, the net is a versatile opportunity for involvement for both newly and seasoned amateur radio operators.

Contact [Jay AA4FL](#) for additional details needed for implementing equipment needed for participating and protecting your neural connections, great involvement for your soul and health!

MARCO CW NET

The Bob Morgan Memorial Net

Our CW net is held every Sunday one half hour before the *Grand Rounds on the Air* net, at 09:30 central time, currently 1530 UTC, on 14.140 MHz. Net control is Chip N5RTF. The net is named after the late MARCO member Dr. Bob Morgan, VE3OQM.

At times in the in the past the net was on the same frequency as the *Grand Rounds on the Air* in an effort to hold the frequency for the voice net to be in the clear at the top of the hour. The net today means so much more to MARCO...

You are invited to participate. With radio license issuance in the US dropping the morse code requirement there are many members who have not had experience with CW. Our net is a great way to gain CW proficiency.

There are many advantages to learning morse code, a yes-brainer. There is increasing evidence that not only GM plasticity but also changes in white matter are important in the context of learning processes, see <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5526915/>.

Use CW through the MARCO net to keep those neural connections intact and resist the aging process! Links to other sources follow. Add to the discussion by posting to the MARCO google group: marco-ltd@googlegroups.com

[ARRL resources for Morse Code](#)


[Morse Code Instruction Learning, YouTube Options](#)

[Code Buddy Volunteers](#)

MEMORIES OF YEARS AGO IN MARCO

Our History Book

Twenty Five years ago in MARCO—April/May 1998



The

MARCO

NEWSLETTER

Official Publication of the Medical Amateur Radio Council, Ltd.

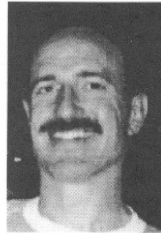
Ira Wexler, M.D., W3HEF, President
 Robert D. Currier, M.D., WB5D, President-Elect
 Robin J. Staebler, M.D., K3FP, Secretary
 Alfred E. Grcenwald, M.D., WA2CDA, Treasurer
 Edward R. Briner, D.M.D., WA3TVG, Editor

VOL. XXI NO.8 APR/MAY, 1998

IT'S ANNUAL MEETING TIME AGAIN

It won't be long before we once again gather in Dayton for the world's biggest hamfest, and also, this year, the annual meeting of the Medical Amateur Radio Council. Little can be said about the hamfestif you've been to one you know what a great hamfest it is.....if you've never been there, you've really been missing a great ham extravaganza.

Every other year, MARCO's annual meeting is held in conjunction with the Hamfest. This year MARCO will be meeting at a new hotel, the Holiday Inn North. It is only a short distance from the former site of our biannual meetings. The annual meeting will begin Friday morning.



Dr Gregory D Lapin

Just How Dangerous is RF Energy?

by Gregory D. Lapin, PhD, P.E., N9GL

"A look at the research on RF bioeffects that led to the new FCC

[Click for the full edition](#)

- The feature article was *Just How Dangerous if RF Energy?* Click on the graphic of the edition to read the full article. For additional Information see [RF exposure and You](#), a free download from the ARRL.
- Note the President-elect was Dr. Bob Currier, who the current *Bon Currier Grand Rounds* on the Air HF net is named for.
- A column on *What's New in Medicine* is included in the April 1998 edition. Compare and contrast that to the style of the this April 2023 edition where the column *Rambling Around with Warren Brown* tackles a similar subject through information in The Harvard Men's Health Watch.
- New member profiles were highlighter in this edition. There have currently been requests to do an online and secure members only password protected directory where you can self-enter the information you would like to share with other members. Please share you thought on that by emailing us at membership@marco-ltd.org.

Ten years ago in MARCO—April 2013


President: Mary Favaro, M.D., AE4BX
 Past President: Linda Krasowski, RN, KE5BQK
 Pres. Elect: Jeffrey Wolf, M.D., K6JW
 Secretary: Danny Centers, EC, W4DAN
 Web Master: Bruce Small, M.D., K4ML
 Treasurer: Danny Centers EC, W4DAN
 Bio-Internet: Chip Kolster, M.D., NR7F
 e-diShare: Arnold Kalin, M.D., WB6JUB
 News Editor: Warren Brown, M.D., KD4GUA

Marco Blogsite: marco-ltd.blogspot.com
 "listserve": <http://googlegroups.com>

MARCO's "AETHER" Pronounced "Ether"
 Medicine & Radio in One Medium

Official Publication of the Medical Amateur Radio Council

80th Edition
 2000-2013



A non-profit Corporation, founded in 1965, privately supported for the public good and dedicated to the advancement of Medicine through Amateur Radio.

Web Site: <http://www.marco-ltd.org>
 Internet address: warrenbrown@aol.com

Vol. XXXVIII, (38th year), Edition #80 since Year 2000), April 2013 P.O. Box 127, Indian Rocks Beach, FL., 33785-0127

HEART FAILURE

IT HAPPENS TO ALL OF US, SOONER OR LATER, IF WE LIVE LONG ENOUGH. THE HEART IS SIMPLY UNABLE TO DISTRIBUTE BLOOD FLOW TO MEET THE NEEDS OF THE BODY. 20% HOSPITAL READMISSION RATES AT ONE MONTH; 50% AT SIX MONTHS.

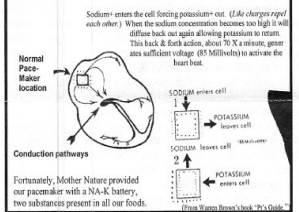
Heart failure (HF) often called "congestive heart failure (CHF) occurs when the heart is unable to provide sufficient pump action to distribute blood flow to meet the needs of the body. Heart failure can cause a number of symptoms including shortness of breath, leg swelling and exercise intolerance. The condition is diagnosed with echocardiography and blood tests. Treatment commonly consists of lifestyle measures such as smoking cessation, light exercise, dietary changes and medications. Sometimes it is treated with implanted devices (pacemakers or ventricular assist devices) and occasionally a heart transplant. Common causes of heart failure include myocardial infarction and other forms of ischemic heart disease, hypertension, valvular heart disease and cardiomyopathy associated with aging. It is common, costly, disabling, and potentially deadly. It is present in 6-10% of the population over 65. (Cardiac arrest is different because then there is NO output at all)

The heart consists of four chambers, left and right atriums on top and left and right ventricles on the bottom. Heart failure can originate on the left and the right side of the heart or with both. The nomenclature of the physiology is confusing. Below is a short refresher:

Signs & symptoms of Left-sided heart failure: Increased rate of breathing, shortness of breath, rales or crackles heard in the lung bases and pulmonary in late stages. There may be a third sound (S3) heard to the left and

LIFE ITSELF. HOW THE HEART BEATS:

The heart is an electrical pump. The human race passes, with the conception of life, the energy to operate a battery—called a "pacemaker." This is the very source of life itself—for when the battery runs down productive life will begin to cease—and when its energy is depleted life itself will stop. The energy needed to activate the heart pump is generated by the reciprocal passage of two substances, sodium & potassium, in and out of the pacemaker's cells. This is the so-called "Sodium-Potassium Pump."



Adequate amounts of sodium (Na+) and potassium (K+) in the body are necessary for the pump to work efficiently. Inadequate amounts may result in an irregular rhythm or stoppage entirely—cardiac

[Click for the full edition](#)

- Heart Failure and it's causes were the cover article for this edition.
- Dreams were discussed in a prominent article. There is no mention as why people have attacks and pass-away in their sleep. What else can intensify during sleep? Do you grind your teeth in your sleep? If you do, do you also do so during the day? If not do you think the forces of grinding at night exceed the forces of chewing? Would that need be the same source as heart attacks during sleep? You might want to read and sleep on it, and see if your heart or teeth wear out first.
- Speaking of chewing Bobbie W1BW has an article about ragchewing's origins.
- The WWII involvement of Hedy Lamarr was featured in an article as well as many other excellent pieces that highlight the quality of individuals in MARCO membership. How about continuing this tradition of contributing articles by submitting them to aether@marco-ltd.org.

WRITE TO US!

We welcome your comments.
Email aether@marco-ltd.org

Disclaimer: Letters and articles may be edited for brevity & clarity. **All content, including linked unedited member article submissions, and linked online material, are not the opinion of MARCO. The Aether's content is not Medical Advice.** Graphics selected are the choice of the editor and not of MARCO-ltd.

MARCO NET SCHEDULE

<u>DAY</u>	<u>TIME</u>	<u>FREQ.</u>	<u>NET CONTROLS</u>
Any Day	On the Hour	14.342	Hailing Frequency
Sunday	9 AM Eastern	DV QuadNet	Jay AA4FL
Sunday	10:30 AM. Eastern	14.140	CW Net, Chip, N5RTE
Sunday	11 AM Eastern	14.342	Jay, Warren, KD4GUA

MARCO'S CW NET, the "Bob Morgan Memorial Net"
(precedes the Grand Rounds on Air net, meeting on Sundays, 14:30 UTC, 14.140 MHz)

Page 14

MARCO Grand Rounds is held Sunday at 11 a.m. Eastern Time; 10 a.m. Central; 9 a.m. Mountain, and 8 a.m. Pacific Coast time on 14.342. You qualify for one hour Category II CME credit with your check-in.

MediShare International News
Arnold Kalan, WB6OJB, Director



The charitable arm of MARCO is active developing new projects and appreciative of your donations. Recognize other members for their accomplishments and life events with a donation that will be recognized in the *Aether*.

Donations are fully tax deductible and you will receive a note of thanks with wonderful MARCO seals that look very nice on QSL cards. MARCO is a 501 (3)(c) organization, and MediShare International is a project of MARCO.



Take this opportunity to participate in MARCO's way of helping the less fortunate worldwide. For more details about MARCO's Project MediShare and the types of projects it [supports click here](#). It is a reality, not just a moniker, that [HamsCare](#) at MARCO. New projects are in the process of being developed with the assistance of Wayne K4WFP and Jay AA4FL.

Note the numerous donations received during this cycle of the *Aether*, as documented in the Membership News section of page 15 .

[Click to donate online](#) or mail written checks made out to MARCO, noting MediShare in the check's "for" area. Send your donation to MARCO c/o Secretary Jay Garlitz, PO Box 1333, Hawthorne, FL 32640



Thank you , Stay Well & God Bless,

Arnold

Arnold (Doc) Kalan, M.D., WB6OJB, MARCO #673



Above—Arnold WB6OJB joined Jay AA4FL, Bernie KD5QHV, and Barry WB1FFI at the War Eagles Air Museum in the El Paso area.

Joan and Arnold at the US Border Patrol Museum.



The Secretary's Keyboard Korner

secretary@marco-ltd.org



In this Annual Meeting edition of the *Aether* you can view a return to the enjoyment of in-person meetings. Our hope is that we will transition back to less meetings by zoom and more eyeball QSO events. Read about plans within the pages of this *Aether*.

In the Membership News section I am pleased to see two University of Florida affiliated MARCO members. Mike, KF5LHS, was recently named Chair of Neurology at the College of Medicine in Gainesville, congratulations! New ham Alec, KQ4GSR, is one of my rising third year dental students and plans to upgrade to general soon. His enthusiasm along with that of a core of recently licensed undergrads is renewing our hobby locally and paving the way for the future of ham radio and MARCO, especially if you amplify this effort locally!

Attending meetings in person is not just for MARCO members in our group. They are structured with social activities for spouses, as can be attested to in other pages of this *Aether*. The photos on this page reflect the approach I take to make sure wife Randi always enjoys accompanying me. We allow an extra day or two on either end of our travels to enjoy area attractions of interest, a true meeting vacation! Others in attendance did the same and also in locations on the way there or on their return home.

To provide feedback on this issue of the *Aether* contact the co-editors of our *Aether* editions at aether@marco-ltd.org.

73, *Jay* AA4FL



Top left—Randi and I enjoying hiking in Hueco Tanks State Parks and historic site before the start of the MARCO meeting. It is a location containing many pictographs.

Top right—A pictograph photographed there, one of many viewed. When visiting the Archeology Museum of El Paso we were pleased to see a recreation of this one depicted there!

Bottom right—The Krasowskis and Garlitzs enjoying a post-meeting dinner together, Texas BBQ!

MARCO Membership News

February 2023 -- March 2023

New Member

KQ4GSR—Alec Simonson, Gainesville, FL

Renewals

KF5LHS—Michael Jaffee, Gainesville, FL (5 years)

N9OML—Howard Marcus, Huntley, IL (2 years)

W2SCT—Ken Cheng, Valley Cottage, NY (5 years)

W3GAT—Thomas Reilly, Shreveport, LA

W4DAN—Danny Centers, Cleveland, TN

W0FFC—Gerald Meltzer, Lone Tree, CO (5 years)

Silent Key—W3HEF, Ira Wexler, Lewes, DE

MediShare Donations in memory of Terry Keister

Bruce and Theresa Small

Arnold and Joan Kalan

Jay and Randi Garlitz

MediShare Garlitz donation in honor of Bernie

KD5QHV and Linda KE5BQK 's hosting of the annual meeting in El Paso



Payment Options for Renewing your Membership or Joining MARCO

Membership dues, for new joins and renewals, are processed by email. At the time of annual billing invoices are invoiced to each member. The default billing term is unified for all types of members, two years for \$45.

MARCO encourages members to consider a five year membership of \$100. This reduces your yearly cost of membership and simplifies our annual billing by our all volunteer staff. Existing members can choose to extend your membership at any time. Please use the online form at <https://marco-ltd.org/join-marco-amateur-radio/> and select the five year term from the pull down list. Completing the entire form just as you were a new member assists us with keeping your information current in our membership database.

Once submitting the online form **if you have a problem with the form appearing not to submit** (spinning icon), email the issue to Jay AA4FL at secretary@marco-ltd.org to confirm it went through.

For New members, and current members desiring to extend their membership term, the membership committee will receive your online application and process an invoice to be sent by email.

Online payment processing is available once invoiced by email. One opens the invoice and buttons at the top left are present to credit card payments (Stripe), and for PayPal.

Thank you for your Membership!

Medical Amateur
Radio Council



**The Medical Amateur
Radio Council Ltd.**

Online editions of the *Aether* can be printed by the reader for use at home but linked information available through clicks within the online document will not be available. Note in using the online edition you have control of the size of the text and images, being able to zoom in for more comfortable and informative reading.

This is the 140th edition of *The Aether* (2000-2023) since Warren Brown, KD4GUA, became editor, and the 10th online only edition by co-editor Jay Garlitz, AA4FL.

MEDICAL AMATEUR RADIO COUNCIL, LTD.
New Membership Application & Renewals

Apply or renew online using the [online join form](#), which if you are already a member will be processed as a renewal. Once you fill out and submit the online form it will be reviewed by the membership committee. Upon approval you will be invoiced by email with a link to pay online by credit card or PayPal.

<https://marco-ltd.org/join-marco-amateur-radio/>

If you need to pay by check use this application form. Send the written form to the mailing address below.

Check your preference:

- One year membership \$25 (USD)
- Two year membership \$45 (USD)
(the default billing for renewal)
- 5 year membership \$100 (USD)

Name: _____

Address: _____

Health Related Career (if appropriate)

Call Sign: _____ Type License: _____

Phone: _____

email: _____

Birthday _____ (year, full DOB optional) Member ARRL: Y / N

Written applications for membership should be sent to

Membership Committee
c/o Secretary Jay Garlitz, AA4FL
PO Box 1333
Hawthorne, FL 32640, USA