Please credit the University of Michigan College of Engineering and the W8UM Amateur Radio Club,

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Amateur Radio Continues to Connect the World

The University's amateur radio club, located in the College of Engineering Building, offers engineering challenges and a chance to network with students, faculty, staff, alumni, and strangers both on the other side of the world and those orbiting it.

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The University of Michigan Amateur Radio Club, W8UM, offers engineering challenges to interested individuals with or without an amateur radio license. Members have access to the many radios and antenna's provided by the College of Engineering and "club" donors, thus providing a means to communicate to the other side of the world and those orbiting it. For individuals not having a radio license, they can still experience the excitement while in the presence of a "licensed" radio operator. As of recently, Morse code is no longer a requirement in obtaining a radio license.

Before iMessaging, email, the telephone and Snapchat, there was telegraphy; sending dits and dahs through the air. Amateur radio or "ham radio" has been connecting people from all over the world for more than a century. The University of Michigan Amateur Radio Club, founded in 1913, continues to provide students – as well as faculty, staff, and alumni – opportunities to familiarize themselves with the concepts, techniques and applications of practical radio communications here on campus.

"You can do it for fun. You can do it for education. You could do it for the public good such as assisting groups like the Red Cross" says Don Winsor, the Electrical Engineering & Computer Science Departmental Computing Organization Coordinator who provides IT support to the club. Recently, in 2017, W8UM was asked to assist an university employee in locating a family member who had not been heard from following Hurricane Irma.

The W8UM radio equipment includes 3 HF transceivers, and 4 VHF / UHF transceivers. The main antenna, roughly 40 x 40 feet in size, is a rotating multi-band SteppIR antenna designed for the HF radio spectrum; 54 MHZ – 7 MHZ. For the VHF/UHF frequency (144 MHZ band and 440 MHZ band), W8UM

operates a pair of circular, polarized, antennas for satellite communications. With these, individuals can communicate using their voice, Morse code, send images using slow-scan television or use a computer to send digital tones such as PSK or FT8. For "local" communications, W8UM operates a radio repeater with EchoLink® connections housed in Weiser Hall (former Dennison Building).

While atmospheric conditions, elevation above ground, antenna characteristics and environmental surroundings can all affect a radio signal, W8UM's equipment improves the liklihood for students, and others, to communicate with people from all over the globe without much difficulty. "You can go to the hobby store and get a radio that will work over short distances, but if you want something that can operate over a great distance, you need this technology," Winsor says.

Originally recognized by the radio callsign 8XA (experimental license) and later as W8AXZ, the university station, then located in West Engineering, was considered the most powerful transmitting station in the country. When transmitting on full power, the antenna, stretched along South University, would turn blue and the tones of Morse code could be heard as far as 4-5 blocks away from campus.

W8UM has born witness to several significant moments in history. During the March, 1913 storms, where most of the Midwest was under water, the university radio operator, Benjamin N. Burglund, heard several distress messages coming from Ohio. One came from Herbert Ackerberg, a 15 year-old. The other was received from a Dudley Nichols. Both asking for immediate help. Burglund then sent a message asking that any station who could hear his radio signal that urgent assistance was required in Ohio. This marked the beginning of relaying emergency messages across the country. The following year, the American Radio Relay League was formed; the guiding organization for amateur radio operators. Ackerberg went on to become the chief radio engineer and a vice-president of Columbia Broadcasting System. Nichols would enroll and completed his education at the university afterwards moving to Hollywood to become a producer. Nichols created and served as president of the Screen Writers Guild, later winning an Academy Award. Burglund would later become the chief electrician for the U. S. Navy submarine base and made technical improvements to Edison's phonograph.

On May 7, 1915, communication of the sinking of the Lusitania, which is considered a critical event that helped bring America into World War I was received. The station also handled radio messages for the Byrd expedition to Antarctica – a U.S. Navy operation that occurred from 1933-1947 with the goal of photomapping the area to eventually construct a research base.

At about the same time, Professor Hobbs, during his exploration of Greenland, maintained scheduled radio communications exchanging his observations on the climate and geologic formations of Greenland to his university department in Ann Arbor. It was also the station that facilitated the first

communication between the North Pole (Hobbs Expedition) and the South Pole (Byrd Expedition) thus allowing both researchers to communicate directly.

"Colonel" Robert McCormick (Chicago Tribune) also depended on the campus wireless telegraph station to exchange vital information to the pilots of the Untin Bowler. This was McCormicks personal attempt to establish air travel directly from Chicago to Berlin. The amphibious plane sank in the artic region with the pilots being rescued by Professor Hobbs.

Many more contributions of telegraphy occurred on campus before being recognized as a club. As far back as 1864, telegraphy, then originating from the Detroit Observatory, provided longitudinal information to the Great Lakes surveyors and time determination to both the City of Detroit and train stations. Communications between the university's geologic camps in Wyoming, Northern Michigan and the Lamont-Hussey Observatory, in South Africa, all took place in the university telegraph station. But one of its most famous contributions to the university itself happened during the fall of 1903. In 1903, Floyd "Jack" Mattice, a U-M law student and radio operator, telegraphed the October 31st away football game between Michigan and Minnesota, where a reportedly suspicious Fielding Yost purchased a five-gallon jug to ensure clean water for his team. Yost accidentally left the jug behind, but when he asked for it to be sent to him, he was told that if he wanted it, his team would have to win it back. The competition for the "Little Brown Jug," the oldest "trophy" in college football history, was born.

Transmitting in Morse code, Mattice telegraphed the events of the game to telegraph operators in University Hall who deciphered the code and announced the events of the game to the 5,000 students. It was the first time that Michigan students could hear a football game "live" as opposed to reading about it the following day in the Michigan Daily, and was the earliest instances of live sports broadcasting.

Today, despite cell phones and the internet, there are still many relevant applications for amateur radio. "During natural disasters, we may lose electricity for a prolonged period of time or we may lose cellphone towers, and then the ability to communicate is disrupted," says John Palmisano, a station manager. "With amateur radio, "our" transceivers can be operated using a car battery or solar cells, and as long as we can suspend two wires in a tree, we can often make a radio contact."

Due to the close proximity of the Fermi Nuclear Reactor and the transportation of hazardous material along the adjoining expressways and railways, amateur radio operators are often called upon to assist if an emergency might occur. "The two things they worry most about in this town are severe storms or some kind of accident with hazardous materials where they would have to set up a shelter in a school gym," says Winsor. "If phones aren't working, how else would you communicate with the shelter, especially about things like special medical needs?"

Reid DesErmia, a junior in Electrical Engineering, became interested in the emergency communication applications of ham radio after serving in the military. DesErmia, a U.S. Navy veteran, served two deployments on a destroyer as a Radar Technician. "Not only did we use the radio to communicate to each other, it was also used it for exchanging data and tracking," DesErmia says. "All Navy vessels were tracked on maps using radio frequency technology, today, amateur radio operators use APRS (Automatic Packet Reporting System) in much the same way. After I got out, I went and got my amateur license so I could continue to use the technology." DesErmia is also member of the Washtenaw County RACES, the Radio Amateur Civil Emergency Service which provides emergency radio communications for the county, and SkyWarn, the National Weather Service program for severe storm spotters.

Amateur radio has other useful applications. On campus, practical use of ham radio is used during balloon launches and recovery, projects involving remote environmental monitoring, and cubesat missions. For instance, W8UM aided MRover in improving their communications, for places where rovers have to operate generally don't have good cell service. Just recently, W8UM along with Case Western University, participated in a frequency measuring test; a method to studies ionosphere characteristics and estimation of Doppler shift.

In addition to the practical uses, members say ham radio is appealing because it's just fun. "There is a fascination with the equipment and there is the fascination that you don't know who is going to hear your radio signal," Palmisano says. "They could be 20 miles away or on the other side of the world."

Or they could even be from outside this world. Anthony (Tony) England, the Dean of the College of Engineering and Computer Science at U-M Dearborn and Professor of Engineering is a member of the club and a former NASA astronaut. England was flying a mission on the Space Shuttle Challenger, in 1985, when he heard a call over his amateur radio. The individual was someone with a hand-held transceiver who, like most ham radio operators, was just hoping to make a new radio contact. "This is W0ORE (Tony's personal radio callsign) on the Space Shuttle Challenger," England replied. "How are you today?"

William Becher, an adjunct professor in engineering and former club advisor, says that for him, the most interesting aspect of ham radio isn't the communication possibilities but rather the engineering challenges of building radios and antennas. In fact, Becher and his wife Helen, also a ham radio operator, assembled and installed the large, 4-element, SteppIR antenna visible on top of the Engineering Building. It was the second one they built, for the first one was even bigger, and the university was concerned that it would be too heavy for the roof.

Another distinction of the club is that, unlike other campus organizations, amateur radio can be a lifetime hobby, thus its membership may span several generations. This affords an excellent opportunity

for students to network with current and emeritus faculty, staff, and the many individuals who have enjoyed this fascination with amateur radio. “Ham” radio offers a lot, but it can be kind of overwhelming when you get into it, because there can be so much information,” DesErmia says. “It’s really nice having people who have done it to help guide you.”

W8UM is open to anyone to join and has monthly meetings during the academic year. Topics presented have included vacuum tube theory, restoration process of a 1930’s era Radio Manufacturer Engineering radio receiver, parasitic antenna arrays, and software defined radio applications. During each meeting, experienced members take the time to answer any questions and provide any necessary training to assist the “new” radio user. Members also assist those interested in advancing to a “higher” level radio license; Technician, General and Extra. Each level offers a greater portion of the radio spectrum to utilize.

For those with an interest in obtaining their radio license, for personal use or for participation in class programs such as balloon launches, Dan Romanchick (KB6NU) provides a 6-hour lecture, on a Saturday, where students learn the material necessary to successfully obtain their Technicians Radio License at the end of the lecture.

In addition to the many events club members participate in during the year, perhaps the most important is their annual competition against the Michigan State University Amateur Radio Club. This competition, like many others, include making as many radio contacts as possible during an allotted time period. “It’s an exciting hobby,” DesErmia says, “because you can pretty much do whatever you want.”

Professor Amir Mortazawi, Ph.D. serves as the W8UM Faculty Advisor.

To learn more about the club, visit their website or email W8UMinfo@umich.edu.