The University of Michigan Amateur Radio Club (UM-ARC)

IEEE Information Session

March 13, 2007

Today I'll answer some questions:

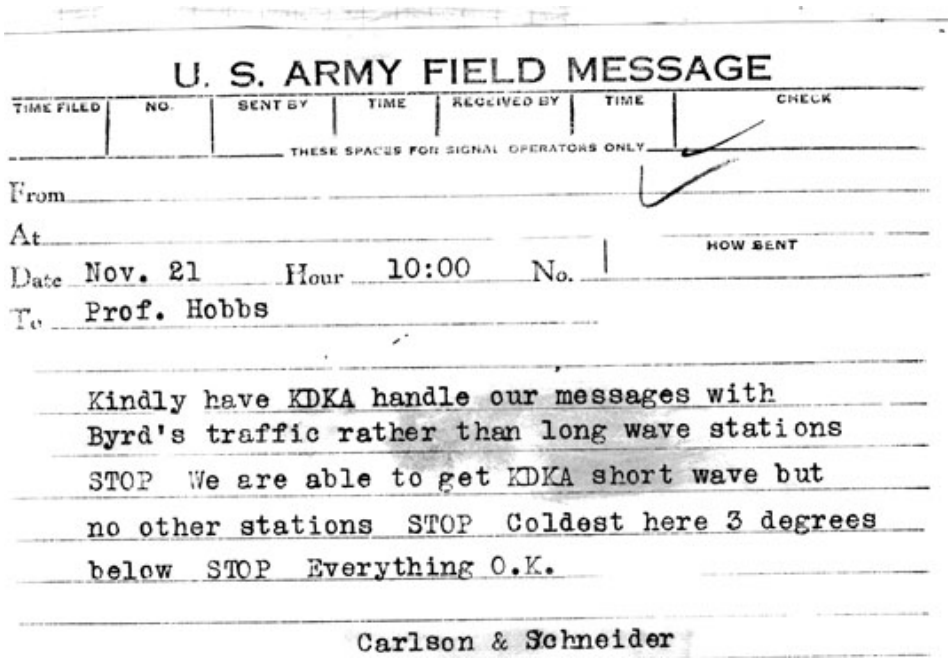
- What is Amateur Radio? (a.k.a. "ham radio")
  - A little history
  - Activities (so many to choose from!)
  - Do I need a license?
- What does the UM Amateur Radio Club do?
  - Operate an HF/VHF/UHF/+++ station (W8UM)
  - Help others get involved in amateur radio
    - License classes!
  - Club activities/projects
  - Public service
- How can I get involved?

What is Amateur Radio?

- Amateur Radio is also called “ham radio” and amateur radio operators called “hams”
  - Technical and non-technical people, every walk of life!
- Hams have a few things in common
  - Fascination with radio and communication – the magic of radio!
  - Interested in tinkering with electronics, radios, antennas
  - A very social group of folks, many just love to talk!
- Hams have an illustrious history at Michigan
  - Amateur radio has been around almost since the discovery of radio itself – ARRL began 1914, trans-Atlantic contact 1922
  - Many pioneers in science and engineering are amateur radio operators (notably our own Prof. Tony England W∅ORE and John Kraus W8JK)
  - UM-ARC – 1913, 8XA

Another Bit of History

- 1928 Byrd Expedition
- Lusitania sinking
- Contesting



U. S. ARMY FIELD MESSAGE

TIME FILED	NO.	SENT BY	TIME	RECEIVED BY	TIME	CHECK

THESE SPACES FOR SIGNAL OPERATORS ONLY

From

At

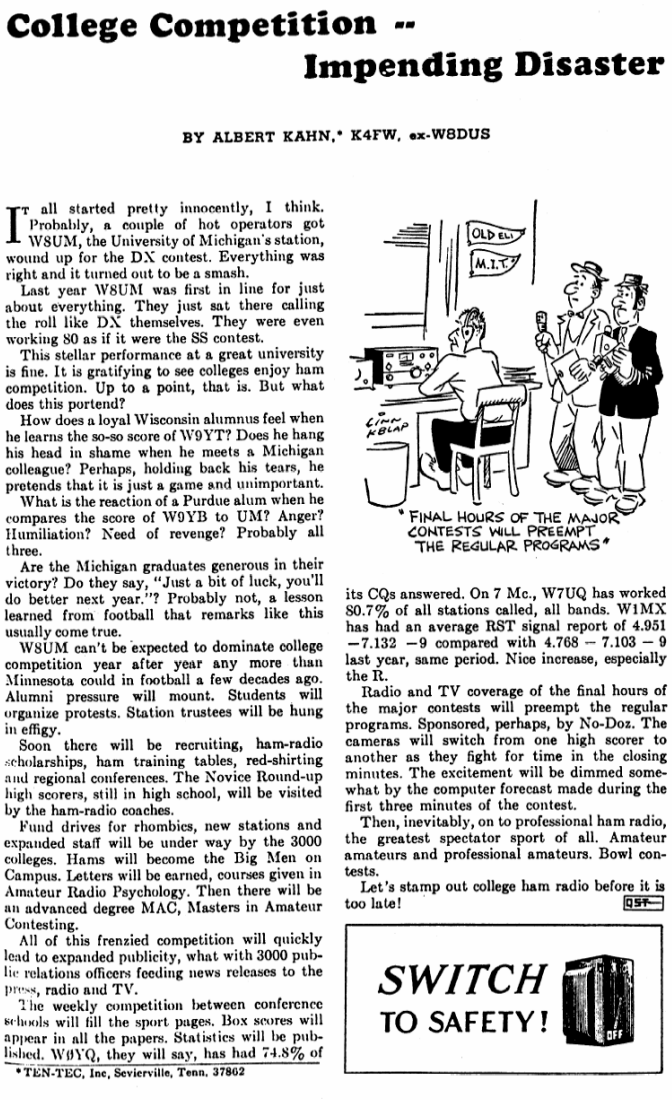
HOW SENT

Date Nov. 21 Hour 10:00 No.

To Prof. Hobbs

Kindly have KDKA handle our messages with Byrd's traffic rather than long wave stations STOP We are able to get KDKA short wave but no other stations STOP Coldest here 3 degrees below STOP Everything O.K.

Carlson & Schneider



College Competition -- Impending Disaster

BY ALBERT KAHN,* K4FW, ex-W8DUS

IT all started pretty innocently, I think. Probably, a couple of hot operators got W8UM, the University of Michigan's station, wound up for the DX contest. Everything was right and it turned out to be a smash.

Last year W8UM was first in line for just about everything. They just sat there calling the roll like DX themselves. They were even working 80 as if it were the SS contest.

This stellar performance at a great university is fine. It is gratifying to see colleges enjoy ham competition. Up to a point, that is. But what does this portend?

How does a loyal Wisconsin alumnus feel when he learns the so-so score of W9YT? Does he hang his head in shame when he meets a Michigan colleague? Perhaps, holding back his tears, he pretends that it is just a game and unimportant.

What is the reaction of a Purdue alum when he compares the score of W9YB to UM? Anger? Humiliation? Need of revenge? Probably all three.

Are the Michigan graduates generous in their victory? Do they say, "Just a bit of luck, you'll do better next year."? Probably not, a lesson learned from football that remarks like this usually come true.

W8UM can't be expected to dominate college competition year after year any more than Minnesota could in football a few decades ago. Alumni pressure will mount. Students will organize protests. Station trustees will be hung in effigy.

Soon there will be recruiting, ham-radio scholarships, ham training tables, red-shirting and regional conferences. The Novice Round-up high scorers, still in high school, will be visited by the ham-radio coaches.

Fund drives for rhombics, new stations and expanded staff will be under way by the 3000 colleges. Hams will become the Big Men on Campus. Letters will be earned, courses given in Amateur Radio Psychology. Then there will be an advanced degree MAC, Masters in Amateur Contesting.

All of this frenzied competition will quickly lead to expanded publicity, what with 3000 public relations officers feeding news releases to the press, radio and TV.

The weekly competition between conference schools will fill the sport pages. Box scores will appear in all the papers. Statistics will be published. W9YQ, they will say, has had 74.8% of its CQs answered. On 7 Mc., W7UQ has worked 80.7% of all stations called, all bands. W1MX has had an average RST signal report of 4.951 −7.132 −9 compared with 4.768 − 7.103 − 9 last year, same period. Nice increase, especially the R.

Radio and TV coverage of the final hours of the major contests will preempt the regular programs. Sponsored, perhaps, by No-Doz. The cameras will switch from one high scorer to another as they fight for time in the closing minutes. The excitement will be dimmed somewhat by the computer forecast made during the first three minutes of the contest.

Then, inevitably, on to professional ham radio, the greatest spectator sport of all. Amateur amateurs and professional amateurs. Bowl contests.

Let's stamp out college ham radio before it is too late!

* TEN-TEC, Inc, Sevierville, Tenn. 37862

OLD ELI

M.I.T.

"FINAL HOURS OF THE MAJOR CONTESTS WILL PREEMPT THE REGULAR PROGRAMS"

SWITCH TO SAFETY!

August 1969 53

Amateur Radio Activities

- Radio communication using a wide variety of “modes”
  - Voice (called “telephony”)
  - Digital (using computers with a radio “link”)
  - Morse code (many reasons hams still use code!)
  - Television (“slow-scan” and “fast-scan”)
  - Many other specialized sub-categories
- …And frequencies!
  - Amateur Radio is allowed on a wide range of radio frequencies from just above the AM broadcast frequencies (1.8 MHz) to light!
    - HF (“high frequency”) or “shortwave” very popular, useful for long-range communications, in fact all over the world!
    - VHF/UHF for local communications (with interesting exceptions)
    - Microwave (above 1 GHz) for local and satellite communications, radio “links”, experimentation
  - This also leads to a wide variety of equipment to use!

US Amateur Radio Bands

Effective Date February 23, 2007

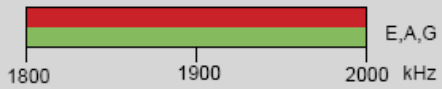
ARRL The national association for AMATEUR RADIO

US AMATEUR POWER LIMITS

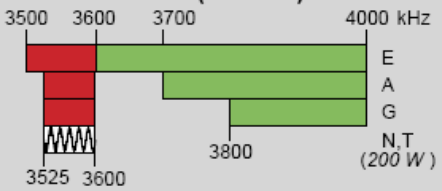
At all times, transmitter power should be kept down to that necessary to carry out the desired communications. Power is rated in watts PEP output. Except where noted, the maximum power output is *1500 Watts*.

160 Meters (1.8 MHz)

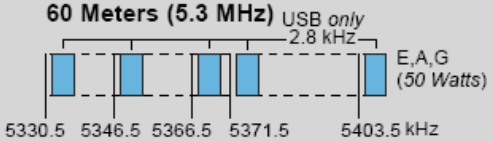
Avoid interference to radiolocation operations from 1900 to 2000 kHz



80 Meters (3.5 MHz)

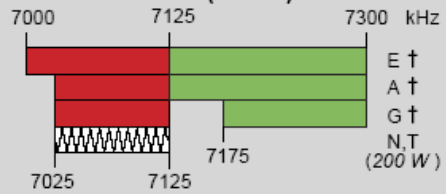


60 Meters (5.3 MHz) USB *only*



General, Advanced, and Amateur Extra licensees may use the following five channels on a secondary basis with a maximum effective radiated power of 50 W PEP relative to a half wave dipole. Only upper sideband suppressed carrier voice transmissions may be used. The frequencies are 5330.5, 5346.5, 5366.5, 5371.5 and 5403.5 kHz. The occupied bandwidth is limited to 2.8 kHz centered on 5332, 5348, 5368, 5373, and 5405 kHz respectively.

40 Meters (7 MHz)

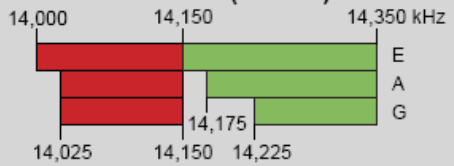


† Phone and Image modes are permitted between 7075 and 7100 kHz for FCC licensed stations in ITU Regions 1 and 3 and by FCC licensed stations in ITU Region 2 West of 130 degrees West longitude or South of 20 degrees North latitude. See Sections 97.305(c) and 97.307(f)(11). Novice and Technician licensees outside ITU Region 2 may use CW only between 7025 and 7075 kHz. See Section 97.301(e). These exemptions do not apply to stations in the continental US.

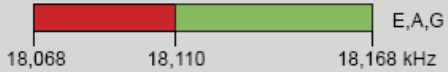
30 Meters (10.1 MHz)

Avoid interference to fixed services outside the US.

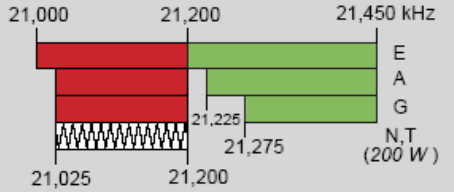
20 Meters (14 MHz)



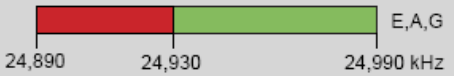
17 Meters (18 MHz)



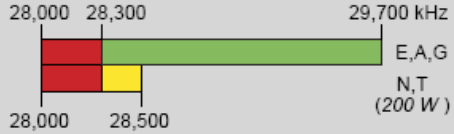
15 Meters (21 MHz)



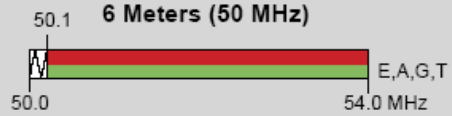
12 Meters (24 MHz)



10 Meters (28 MHz)

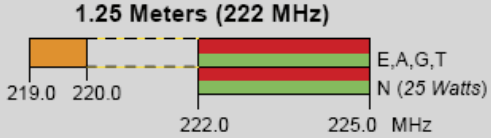


6 Meters (50 MHz)



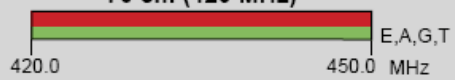
2 Meters (144 MHz)

1.25 Meters (222 MHz)



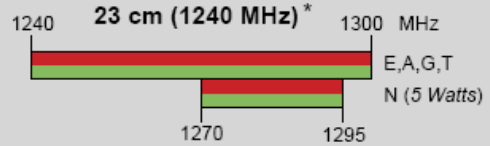
*Geographical and power restrictions may apply to all bands above 420 MHz. See *The ARRL Operating Manual* for information about your area.

70 cm (420 MHz)*



33 cm (902 MHz)*

23 cm (1240 MHz)*



All licensees except Novices are authorized all modes on the following frequencies:

2300-2310 MHz	10.0-10.5 GHz	122.25-123.0 GHz
2390-2450 MHz	24.0-24.25 GHz	134-141 GHz
3300-3500 MHz	47.0-47.2 GHz	241-250 GHz
5650-5925 MHz	76.0-81.0 GHz	All above 275 GHz

KEY

Note:
CW operation is permitted throughout all amateur bands except 60 meters.
MCW is authorized above 50.1 MHz, except for 219-220 MHz.
Test transmissions are authorized above 51 MHz, except for 219-220 MHz

- = RTTY and data
- = phone and image
- = CW *only*
- = SSB phone
- = USB phone *only*
- = Fixed digital message forwarding systems *only*

E = Amateur Extra
A = Advanced
G = General
T = Technician
N = Novice

See *ARRLWeb at www.arrl.org* for more detailed band plans.

ARRL We're At Your Service

ARRL Headquarters 860-594-0200 (Fax 860-594-0259) hq@arrl.org
Publication Orders Toll-Free 1-888-277-5289 (860-594-0355) orders@arrl.org
Membership/Circulation Desk Toll-Free 1-888-277-5289 (860-594-0338) membership@arrl.org

Getting Started in Amateur Radio Toll-Free 1-800-326-3942 (860-594-0355) newham@arrl.org
Exams 860-594-0300 vec@arrl.org
ARRL on the World Wide Web www.arrl.org/

Amateur Radio Activities

- Building radio equipment and antennas
  - Many hams still build all of their radio receivers, transmitters, and other station hardware!
    - Either “from scratch” or kits
  - Great resources available for learning about radio and electronics (see the ARRL handbook in the UM library!)
  - Most use commercially made, state-of-the-art equipment, but know a lot more than just how to push buttons
  - Antenna design and construction is a fascinating part of radio communication and could be a whole hobby (or career!) in itself

Amateur Radio Activities, cont'd

- Contests, Awards, and Special Events
  - Hams compete in contests to make as many contacts as possible
  - Awards such "Worked All States" and "chasing DX"
  - Special event stations commemorating a historical event
- Specialized and Advanced Activities
  - Satellite communications (amateur satellites, shuttle, ISS)
  - Microwave (very high frequency) experimentation
  - "Moonbounce" (Moon as a satellite!)
  - Radio design and construction
- Public Service—A tradition in amateur radio
  - Provide emergency communications (natural disasters, civil defense and homeland security)
  - Public event communications (races, parades, etc.)
  - Military-affiliated services

Amateur Radio Activities, cont'd

- What Amateur Radio is *not*
  - Broadcasting
    - Amateur radio uses **two-way** communication
    - Still, many hams enjoy *listening* to international shortwave broadcasts
  - "CB" (non-licensed, limited radio service)
    - "CB" is informal, at times bordering on "R"-rated!
    - In contrast, ham radio is quite "gentlemanly" and hams abide by on-the-air operating practices established over many years
    - "CB" operates on a narrow band of frequencies around 27 MHz
    - Amateurs have frequency allocations (called "bands" of frequencies) from 1.8 MHz to 20 GHz and beyond!

Do I need a License?

- Yes and No!
  - You DO NOT need a license to build equipment and antennas or *receive* amateur radio signals
  - You DO need a license in order to transmit (send signals) on any amateur radio frequency
- We encourage everyone in the club to get their amateur radio operator's license (a.k.a. "ticket")!
  - Enjoy all the benefits of amateur radio
  - It is not difficult, it just takes a little time to study
  - "Do I need to learn Morse code to get my license?" – NO, not as of February 23rd

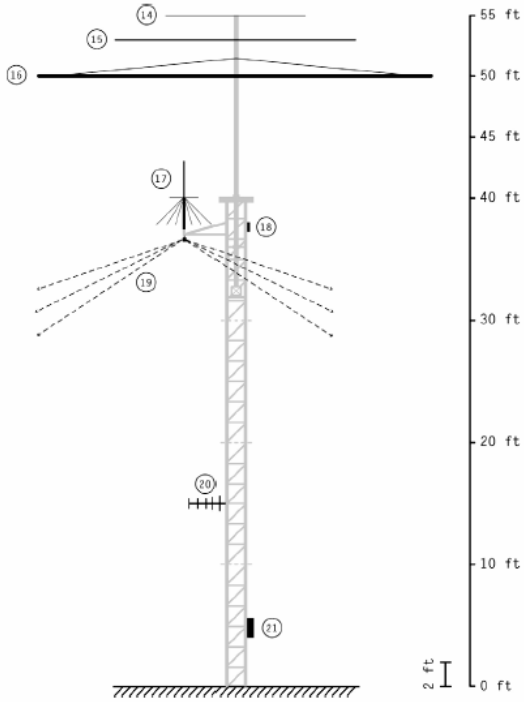
What does the UM Club do?

- History
  - The second oldest amateur radio club in the US (1913)
  - Club station had been on central campus until late 1990s
  - Over the last 3 years, club activity has been renewed and station moved to N. campus (EECS building)
  - Now a SSO – Student Sponsored Organization
- Purpose: Promote Amateur Radio at U of M
  - Club station W8UM
  - FCC amateur radio license classes
  - Support for soon-to-be or new hams
  - Social and technical activities for members
- Club activities
  - Radio building workshops
  - Antenna parties
  - Contests and Special Events (Collegiate QSO Party, Field Day)

Field Day - 2006

The Club Station W8UM

- Equipment
  - Ten-Tec Omni VI HF transceiver
  - Heathkit SB-220 2 kW HF amplifier
  - Icom IC-910H satellite transceiver
  - Icom IC-2100 2m transciever
- Antennas (atop the EECS building)
  - 80m/40m dipole
  - Vertical 20-40m
  - Discone for above 50 MHz
  - Rotatable 2m/70cm yagis for satellite work
- Future plans
  - Roof-mounted tower
  - Rotatable arrays for 40m and above, 2m/70cm terrestrial work



How do I join?

- Join the club!
  - Fill out the membership application (online also)
  - Come to Meetings (1st Monday of the Month)
  - $20 membership fee
    - Maintain and purchase equipment and supplies
  - Talk to Richard KD8APA (rtfrench@umich.edu)
- Get your FCC Amateur Radio License
  - Code requirement dropped as of Feb. 23rd!
  - Monthly exams here in Ann Arbor
- Get involved in club business and activities
  - The club is experiencing a major resurgence right now!
  - Get involved now and really make your mark on a great University tradition
  - Club activities will follow member's interests—tell us what activities you would like the club to offer!

How do I get more info?

- Want more information on Amateur Radio?
  - Club website www.umich.edu/~umarc
  - www.arrl.org *and* www.eham.com (many others)
  - *QST* and *CQ* magazines
  - ARRL handbook (in library)

QUESTIONS?