CQ CHATTER

MAY 2016 VOLUME B16 •ISSUE 3

WOOD COUNTY AMATEUR RADIO CLUB

Minutes

WCARC Meeting

April 11, 2016

Bob-WB8NQW, presiding

Present: N1RB-Bob, K8JU-Jim, KC8NKC-Orville, WD8LEI-Eric, NM8W-Craig, WD8ICP-Chuck, WD8JWJ-Bill, KE8CVA-Terry, KC8EKT-Ruth, N8VNT-Larry, KE8CUZ-Jim, KD8RNO-Lynn, W8AN- Steve, KD8NJW-Jim, WB8ZHU-Thom, WA8SYD-Mike, WB8VUL-Hoot, AA8HS-Bruce, Jenny O'Reilly, KD8VWU-Doug, W8PSK-Loren, K8LL-Stan, WB8NQW-Bob, Bill Linebaugh (guest speaker)

Meeting Called to Order with Pledge of Allegiance at 7:35 pm.

Business Meeting was held after the presentation by Bill Linebaugh, former Heathkit engineer. Bill offered a very anecdote-rich description of his background, career at Heathkit and elsewhere. This led to numerous discussions of various types of Heath equipment.

Business Meeting commenced at 9:05 pm.

Minutes of February meeting approved.

Treasurer's Report-approved.

Old Business:

- Bob reminded everybody that Field Day (June 25-26) will be upon us soon, and we need to begin planning since there is only one remaining business meeting before it occurs. He asked for volunteers to organize it. Bill (JWJ) volunteered to handle the food and Bob (RB) volunteered to rustle up the necessary radio equipment.

- Bob reported that there is nothing new to report on the BiG FabLab project, either on equipment in-

continued---on p.7

NET CHECK INS

Apr 5 Traffic: 0

KD8VWU (NCS)
W8PSK
N8VNT
KD8RNO
KD8NJW
N1RB
KE8CVA
N8YAE
WB8NQW
K8JU
KC8EKT
K8BBK
KE8CUZ
W8MSW
WD8ICP (15)

Apr 12 Traffic: 1

WD8LE I (NCS)
K8BBK
KC8EKT
W8PSK
KD8RNO
KD8NJW
KE8CUZ/AG
WD8JWJ
KE8CVA
KD8VWU
WD8ICP
WB8NQW
N8YAE
WB8VUL
N8VNT
N8HML (16)

BRAIN TEASERS

1. What is the peak voltage at a common household electrical outlet?

a.) 240 V

b.) 170 V

c.) 120 V

d.) 340 V

2. What is the disadvantage of using a trap antenna?

a.) it radiates harmonics

b.) it can only be used on a single band

c.) it is too sharply directional at lower frequencies

d.) it must be neutralized

3. What is the effective radiated power of a repeater station with 50 W transmitter power output, 4 dB feed line loss, 2 dB duplexer loss, 1 dB circulator loss, and 6 dBd antenna gain?

a.) 199 W

b.) 39.7 W

c.) 45 W

d.) 62.9 W

May Contests

The contest lineup for the month of May is given below. Please note that the WARC bands (60, 30, 17 and 12 m) are never open to contesting.

May 7-8	*0001 to 2359 Z*	10 m
10-10 Int'l Spring 'test		**CW**
May 7-8	*1200 to 1159 Z*	160 m to 10 m
ARI (Italy) DX 'test		**all modes**
May 7-8	*1300 to 0700 Z*	160 m to 10 m
7th Call Area QSO Party		**all modes**
May 7-8	*1500 to 0300 Z*	160 m to 10 m
Indiana QSO Party		**all modes**
May 7-8	*1700 to 2359 Z*	160 m to 10 m
Delaware QSO Party		**all modes**
May 7-8	*2000 to 2359 Z*	160 m to 10 m
New England QSO Party		**all modes**
May 14-15	*1200 to 1159 Z*	160 m to 10 m
CQ-M (Russia) DX 'test		**CW-SSB**
May 14-15	*1400 to 0200 Z*	80 m to 10 m
Arkansas QSO Party		**all modes**
May 14-15	*1400 to 2359 Z*	80 m to 10 m
MARAC (County Hunters) QSO Party		**CW**
May 21	*0600 to 2100 Z*	80 m to 10 m
UN DX 'test		**CW-SSB**
May 21-22	*1200 to 1200 Z*	80 m to 10 m
EU PSK DX 'test		**PSK**
May 21-22	*1200 to 1200 Z*	160 m to 10 m
King of Spain DX 'test		**CW**

May Contests-continued

May 21-22	*2100 to 0200 Z*	80 m
Baltic 'test		**CW-SSB**
May 28-29	*0000 to 2359 Z*	160 m to 10 m
CQ WW WPX 'test		**CW**
May 29	*1300 to 1600 Z*	80 m to 20 m
SARL (South Africa) 'test		**digital**

May Hamfests

May 20-22 Dayton ARA. Dayton Hamvention. Hara Arena, 1001 Shiloh Springs Rd., Trotwood, OH.
web: **http://www.hamvention.org**

Digital Communications in Amateur Radio II

by Jeff Kopcak, K8JTK

This time in our quest to get on the air with digital, I'll discuss station setup. For most of this article, it will be related to HF and sideband operation. I'll talk about FM near the end. For a Ham Radio digital setup, three things are needed: a radio, computer, and an interface to connect the two.

First the radio. Theoretically, any radio can be put into digital service. Two things are important to consider: frequency stability and switching speed. Frequency stability is critical to digital operations because drift is deadly. Tube and older radios tend to drift in frequency as they warm up. For a mode such as PSK, drifting a few hertz puts you into someone else's conversation. Switching speed and fast turnaround times are needed. The switching speed of older radios can be hard on relays. Solid-state radios manufactured in the last two decades are recommended. Radios that cover HF/VHF/UHF all mode - open up even more operating possibilities.

Most radios are designed with digital modes in mind. Radios with an "accessory port" or "data port" built in are ready to go, though not plug-and-play. The data port is the

continued---on p.5

WCARC Weekly Net

Tuesdays at 2100 all year

147.18 MHz 67 Hz PL

Net Control Roster

May 3	WB8NQW
May 10	N1RB
May 17	KD8VWU
May 24	KD8NJW
May 31	NM8W
Jun 7	K8OVO
Jun 14	W8PSK

NEXT MEETING

Breakfast Meeting

Saturday, May 7

TIME: 9:00 am

PLACE: Frisch's Big Boy
N. Main St. &
E. Poe Rd.
Bowling Green, OH

digital---from p.4

recommended way to connect an interface to the radio. These ports have pins for keying, transmit audio, and received audio. The audio pins have fixed audio levels and do not change based on the volume setting of the radio. If the radio doesn't have accessory or data ports, microphone and audio out can be used. It's not an ideal situation but it will work. An important thing to keep in mind, some radios mix various audio inputs. An example is an external mic connected to the accessory port maybe mixed with audio coming into the data port. This means audio generated by the computer will mix with ambient noise picked up from the

continued---on p.6

DON'T FORGET!

10 meter in-formal net meets Sunday @ 2030 year round on 28.335 MHz

NET CHECK INS

Apr 19

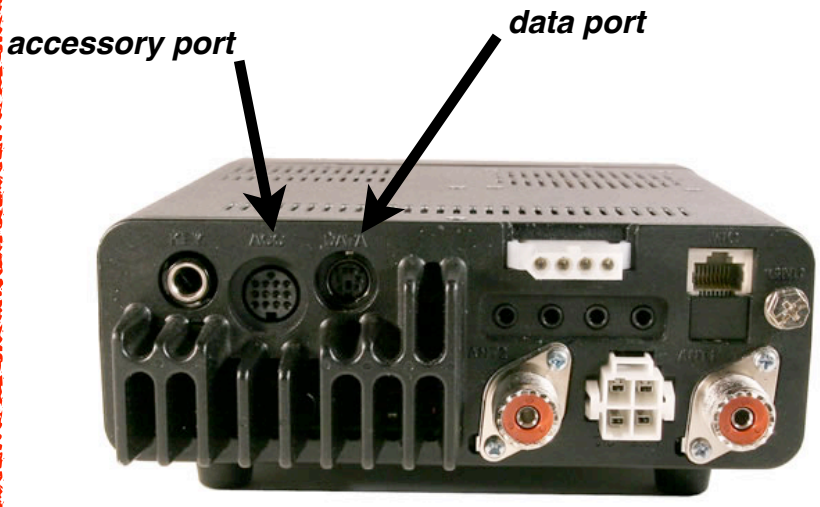
N1RB	(NCS)
N8PYA	
NM8W	
K8JU	
KD8NJW	
KD8RNO	
K8BBK	
WD8JWJ	
KE8CVA	
WB8NQW	
W8PSK	
KD8VWU	
N8VNT	
KC8EKT	
KE8CUZ	(15)

Apr 26 **Traffic: 0**

W8PSK	(NCS)
NM8W/M	
WD8LEI	
K8BBK	
N8VNT	
KD8RNO	
KE8CUZ	
KD8NJW	
N1RB	
WB8NQW	
KC8EKT	
KD8VWU	
KE8CVA	
WD8JWJ	
N8YAE	(15)

digital---from p.5

microphone. You don't want this because you'll interfere with other digital exchanges.



ICOM IC-7000 rear view showing data and accessory ports

It's important to know your radio and how it operates in different configurations. Test with a buddy or Elmer first before jumping in.

CAT (Computer Aided Transceiver) ports on the radio including RS232 (serial port) and CI-V are useful when creating your own interface. Audio cables between your radio and computer would provide transmit and receive audio but these won't key the radio. CAT ports provide a lot of functionally including the ability to change settings in the radio, update memory channels, change frequency, etc. Keying the radio via CAT is universally supported in applications. A configuration example would be using the sound card for audio in/out to the audio out/mic-in on the radio. A separate cable between the computer and radio provides CAT commands, usually via a COM port.

Duty cycle is the amount of time the radio is generating RF. When operating SSB voice, the

continued---on p.8

minutes---from p.1

stallation or on the electronics class the Club might offer. He promised he will address these issues soon.

- Bob and Eric (LEI) recently visited the Offenhauer repeater site with the aim to clean things up and assess what is needed to do so. As part of the BGSU review of the space, WCARC has been granted permission to stay there indefinitely, and was also the recipient of a half-relay rack with a support frame for stacking. Bob and Eric have developed a plan for organizing all WCARC equipment there so that it can be kept under lock and key. Bob requested that the Club purchase three new jumper cables to tidy things up.

- Motion was made and seconded to authorize purchase of cables up to $50 (CVA/EKT). Motion passed unanimously.

- Bob reminded all that we have "plug-and-play" back-ups for the repeater receivers except on the UHF side. Phil (PSK) will initiate a search for one at hamfests, etc.

- Chuck (ICP) reported that he has information that the BGSU Administration Building, which houses the K8TIH repeater transmitters, will be coming down within the next five years. The consensus was that we are presently prepared to make the move since duplexers are in place and space is available in Offenhauer, but it will take some heavy lifting.

New Business:

- Bob reported that he sold more tubes and equipment ($230 worth) from the WA8SCT (Jim Ryan) equipment inventory bequest.

- Bob reported on receiving an e-mail from the "Oathkeepers" organization desiring to get involved in ham radio. Some discussion followed, but no action is to be taken at this time.

- Bob reminded everyone that he he wants to appoint a Nominating Committee soon. If there are no volunteers, he will name names.

- TMRA sponsors a bus to and from the Dayton Hamvention. A number of seats are still available at $40 each. Anyone interested should contact TMRA through their web site.

- Next breakfast meeting is on May 7th and next business meeting is on June 13th.

Meeting Adjourned: at 9:45 pm.

Brain Teaser answers: (E) 1-b, 2-a, 3-b

digital---from p.5

amount of RF the radio generates depends how loud your voice is at that moment. In CW, RF is generated with each dot and dash. In both cases, the radio is operating at less than 100% duty cycle due to pauses in between words and characters. Many digital modes operate the radio near 100% which causes a lot of heat. Heat causes components to fail. Radios are designed for SSB voice though some newer models are including 100% duty cycle. Operate the radio at a power setting of 50% or less (30% recommended) of the total output power. A 100 watt radio would be set between 30 and 50 watts. FM, by nature, is the exception because voice or digital over FM uses the same bandwidth. The typically longer key down times for digital will still generate more heat.

Radios have different operating modes: USB, LSB, FM, AM, RTTY, DATA, DIGITAL and possibly others. HF digital mostly uses Upper Sideband regardless of frequency. In most cases the USB setting is what you want. Some radios will not allow keying from a computer unless they're in a 'digital' mode setting. Check your operating manual and, again, practice and test with a buddy first. Turn off all filters, noise blankers, attenuation and the like or set it to the least disruptive setting. Set transmit and receive bandwidths to the full SSB bandwidth allowed (2.8 kHz).

No filtering and wide bandwidths have less of a chance to distort or modify the signal. Modification of the signal affects the ability to decode a signal. Filtering can be used but after practice and understanding how they affect decoding. Contests usually warrant filtering to keep loud adjacent signals from affecting the exchange.

The interface. It serves two main purposes: act as a modem and the device that keys the radio. It acts like a modem by taking modulated audio from the software application and sending to the radio for transmit and taking received audio from the radio and sending it to the application for demodulation. Nearly all computers and laptops in the last decade have on-board audio while older configurations utilize an add-on sound card. Most computers don't have serial ports these days. If a serial port is needed for CAT, options such as a USB (Universal Serial Bus) to serial adapter, serial port add-on cards, or cables manufactured with USB to serial adapters built in are available.

All-in-one interface solutions make the connection between the radio and computer easy. Solutions offer a built in sound card and fewer cables needed to make the connections. Offerings include products from West Mountain Radio, MFJ, MicroHAM, or

continued---on p.9

digital---from p.8

RIGblaster interface--front view

RigExpert. These options free your on-board sound card to listen to music or surf online minimizing the possibility of transmitting audio not suited for the airwaves. Adjustments on these interfaces are audio levels and speed (delay) at which the interfaces switches the radio from transmit to receive.

Newer models include all functionality integrated into a single USB port requiring only one cable. The recommended solution for a radio without integrated USB audio is the Tigertronics SignaLink USB.

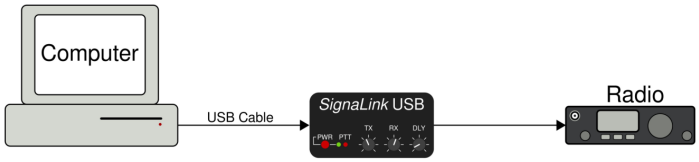
SignaLink USB interface--front view

Two cables are needed to make all connections. A USB cable connects the computer and SignaLink for the audio (sound card) and a cable to the radio for audio and keying.

SignaLink USB interface--rear view

The cable for the radio is specific to connector type or manufacturer. A list of cables is available and simple internal wiring diagram to match the cable to the radio.

Unterminated cables are available to create custom solutions. The SignaLink and cable are about $120 and available at all ham radio retailers. It is a simple VOX ("voice" operated switch) device. When sufficient audio is generated by the computer it keys the radio. It unkeys the radio when that audio has fallen below a threshold.



SignaLink USB connection set up

If you have an interface or are setting one up for the first time, I wrote a tutorial on configuring the interface in Windows. It shows setting default devices and audio levels. These settings help avoid splattering on the bands (taking up

continued---on p.10

digital---from p.9

more bandwidth than intended) due to too much audio fed into the transmitter. Again, practice with a buddy or Elmer to verify optimal audio settings. Included is a section showing how to record digital transmissions and play them back for decoding at a later time (time shift) such as a net: http://www.k8jtk.org/2015/04/16/radio-interface-setup-for-getting-started-with-ham-radio-sound-card-digital-modes/

The computer. Aside from the requirements to make connections, most computers work fine for digital operation. Ones made within the last decade seem to work without issue. Some older ones tend to have issues. A computer with a 1.5 GHz CPU and 4GB of RAM is sufficient. As always, more is better. Windows is the operating system of choice for digital programs. Mac and Linux are well represented with a program or two less viable than their Windows counterparts. Let's not forget portable devices like tablets and smartphones. Digital applications are available for those devices too. My operating has been on a Windows 7 64 bit desktop computer.

Up to this point I've talked about operating digital on HF and Sideband. What about Technicians who don't have access to digital portions of the HF bands? All of these digital modes can be operated over FM so you Technicians can get in on the fun too. Won't be able to transmit as far as an HF station but digital can be transmitted over simplex or even a net on a repeater using an HT! On HF, audio tones are generated by Audio Frequency Shift Keying (AFSK). Audio generated by the computer is converted into RF frequencies when transmitted. Only those frequencies in use at that time are transmitted by the radio. This allows hundreds of exchanges to take place on the same frequency.

FM on the other hand, occupies a full 10 to 15 kHz, even though the bandwidth of the audio generated by the computer is less. So it still holds that only one transmitting station can have the frequency at a time. Yes, this defeats the purpose of narrow bandwidth modes. Someone wanting to learn and experiment with these modes may get bitten by the bug and lead to a license upgrade. I say let them have at it. That's how I did it.

To this point, Stephen Cass - KB1WNR, Senior Editor for the IEEE magazine built a low power FM digital transmitter for just that reason, to get more people interested in digital modes. It's a great maker project or demonstration tool for digital. I also mention it because he used my instructions to get Fldigi running on the Raspberry Pi! http://spectrum.ieee.org/geek-life/hands-on/hands-on-a-ham-radio-for-makers

Next time, I'll start covering specific digital modes, software, and operation. ■

WOOD COUNTY ARC
P.O.BOX 534
BOWLING GREEN, OH
43402